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# THE AUTOMOBILE

## MAKING A GREAT PAPER

IN any important project there are usually two methods open to the issue, both leading to destinations bearing the common title of success, and yet destinations as far separated as are the diverging ways of approach. One is spectacular, importunate and boisterous, and at a distance the sound of its trumpets is sometimes mistaken for real music. The other is laborious, persistent and straightforward, dignifying each step by results accomplished, and realizing that each milestone is a mark of absolute progress.

The making of a great paper involves, first, a broad conception of the proposition and a full knowledge of the requirements, and, second, the ways and means, the organization, the men and the machinery adequate to the conception. Many great papers catering to old-established industries have been developed from small beginnings, but the exponent of a progressive field must be equipped to keep, if not to set, the pace, and must at all times be fully abreast of its latest development.

A business manager and an editor are not to-day a sufficient organization in an industry whose pace is established by the rapid evolution of the automobile. These must be supplemented by complete departments or sub-divided into responsible factors. The business department must have its code of ethics, and its exponent must be a manager of business departments and men, and have executive ability to force an issue to a successful termination, and the editorial conception must be executed on a liberal policy, making the paper the exponent of the industry rather than a rostrum of impracticable theories dictated by a single personality.

The exponent of the automobile industry must carefully chronicle its industrial and commercial activities as well as record its rapid engineering advancement, the requirements of which are not called for and not equaled in any other branch of manufacturing. While the technical paper of an

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industry should not make the mistake of assuming a knowledge beyond the province of its experience, it must be well grounded in general and practical engineering; enabling it to discriminate between the theoretical and the practical, and the sensational and the impossible. In any case its reading pages, which are bought and paid for by the subscriber, must contain candid and trustworthy information free from puffs, write-ups or blackmail, absolutely unbiased by the advertising patronage of the paper. The editorial and business departments must be under competent managers and wholly independent of each other.

THE AUTOMOBILE employs regularly on salary 38 people (not counting 125 to 150 men employed in the printing department) and these are divided into a complete independent editorial department for the production of the paper, and a fully equipped business department for the promotion of the paper as a business proposition.

*The Editorial Department* includes a managing editor, an engineering editor, and a complete staff for the production of the reading pages of THE AUTOMOBILE, there being 5 regular staff writers and editors, and 37 regular paid local news center correspondents, as well as a large number of special writers.

The Business Manager supervises a complete:

*Subscription* and newsdealers sales department, including special canvassers, local agents and correspondents; an

*Advertising* department, with resident territorial solicitors and office correspondents; an

*Accounting* department of cashiers and bookkeepers and correspondents;

*Department of Statistics*, with a manager, stenographers and assistants; a

*Manufacturing* department, which produces the paper from the hands of all the above departments. This department makes up over 5,000 editorial, news, and advertising pages in a year, and consumes over 300 tons of paper. The printed pages put end to end would make a bicycle path from New York to St. Petersburg and back. The volumes for 1905 comprise a complete epitome of the progress of the industry, consisting of 5,356 pages of editorial, news, and advertising matter, illustrated by 1,664 engravings made from original photographs and drawings. The average editions each week for 1905 were 14,038 copies. The guaranteed average circulation of THE AUTOMOBILE for 1906 will be over 15,000 copies every week.

The following is a brief personnel of the leading men engaged in the production of THE AUTOMOBILE:

H. M. SWETLAND, *President.* Publisher of "Power" 1884 to 1902. Publisher of "Engineering & Mining Journal" 1903 to 1904. Founder of several smaller publications. Purchased the "Motor Review" and "The Automobile" in 1902 and consolidated them under the name of THE AUTOMOBILE. Also principal owner of "The Municipal Journal and Engineer."

A. B. SWETLAND, *Treasurer and General Manager;* connected with "Power" 1890 to 1901, as Business Manager after 1895. Also part manager and Vice-President "Engineering Review." Appointed General Manager THE AUTOMOBILE in 1903.

H. F. DONALDSON, *Editor;* received his engineering training in ship and engine building works. He has had extensive experience in metropolitan daily newspaper work. He was Editor of "Marine Engineering" from 1897 to 1900, and has been Editor of THE AUTOMOBILE since 1902.

H. W. PERRY, *Associate Editor;* has been engaged in editorial work for the last twelve years. He was associate editor of "Bearings" from 1895 to 1897, held the same position with "Cycle Age" for two years, and has been associated with THE AUTOMOBILE in the editorial department ever since the inception of the "Motor Vehicle Review," which it succeeded in 1902.

HOWARD GREEN, *Associate Editor;* spent six years in the various mechanical departments of locomotive building and electrical engineering works, and later took up journalistic work. From a New York daily he went to the "Horseless Age," having made a special study of the automobile. He has been on the editorial staff of THE AUTOMOBILE for two years.

LOUIS R. SMITH, *Advertising Representative and Director of The Class Journal Co.* Eastern representative of "The Cycling Gazette," Cleveland, Ohio, from 1894 to 1896. Then occupied a similar position on "The Wheel" for three years, returning thereafter to "The Cycling Gazette." In 1900 was appointed Eastern Representative of "Motor Age" and remained in that capacity for four years, and early in 1904 became a member of the advertising staff of THE AUTOMOBILE.

PAUL MORSE RICHARDS, *General Advertising Representative.* Associated with "The Independent," New York, Publisher of the "New York Observer" for five years from 1885 to 1890, and later with "The Railroad and Engineering Journal" and the "New York Evening Post." Was thereafter Advertising Representative of the "Engineering & Mining Journal," is now part owner and Secretary of "Engineering Review," and for the past two years on the Advertising staff of THE AUTOMOBILE.

WILLIAM I. RALPH, *Eastern Advertising Representative and Vice-President of The Class Journal Co.* Connected with the Subscription Department of "Success," "The Haberdasher" and "The Dry Goods Economist" previous to 1899. Thereafter with THE AUTOMOBILE, first as traveling Subscription Agent and later as Advertising Representative.

C. HARCOURT GURNETT, *Western Representative.* General Manager of the (then) "Automobile Review," Chicago, from 1899 to 1903. Since January, 1904, associated with THE AUTOMOBILE; headquarters, Chicago.

B. FRANK BARNETT, *Advertising Representative.* For several years Advertising Manager of the Paterson (New Jersey) "Evening News" and later on the advertising staff of the "Horseless Age," from 1902 to 1904. Thereafter representing THE AUTOMOBILE in New York State, Ohio, and Western Pennsylvania.

RUPERT B. BRAMWELL, *Advertising Correspondent.* Identified with THE AUTOMOBILE and its antecedents for the past seven years, excepting two years occupied as Advertising Manager of the (now) Pope Motor Car Co.

ROBERT WOLFERS, *Advertising Representative.* Nine years with the "Buffalo Express." Thereafter Eastern Representative of the (then) "Automobile Review," Chicago, and since 1902 associated with THE AUTOMOBILE and now Manager of THE AUTOMOBILE TRADE DIRECTORY.

E. R. MIXER, *Advertising Representative.* Subscription Agent of THE AUTOMOBILE from 1902-1904. Now connected with the advertising department of THE AUTOMOBILE and the OFFICIAL AUTOMOBILE BLUE BOOK.

A. L. MIXER, *Secretary and Cashier;* has occupied his present position as head of the financial department of THE AUTOMOBILE since its organization in 1902.

HEARD RESPESS, in charge of Art and Advertisement Writing Department. Fifteen years' experience in newspaper, magazine, trade-paper and mercantile advertising, with such publications as "The Atlanta Constitution," "Clothier & Furnisher," "Dry Goods Economist," "Power," and "American Machinist."

B. F. REUTHER, *Advertising Editor,* practical printer. For several years owned and managed printing plant. With THE AUTOMOBILE since beginning of 1903.

F. M. DUNN, *Subscription Department.* Subscription Agent for "Power" 1895 to 1902; 1903 same position with "The Engineer"; since that time with THE AUTOMOBILE.

M. D. POWERS, *Subscription Department;* Subscription Agent for THE AUTOMOBILE from its inception, working mostly in New England.

Also regularly on the subscription staff, H. C. SAMSON, located on the Pacific Coast, and H. HOWELL, located in the Middle West, besides over 500 local subscription agents throughout the entire country.

A. L. MIXER
W. I. RALPH
P. M. RICHARDS
ROBERT WOLFERS
B. FRANK BARNETT
C. HARCOURT GURNETT
H. M. SWETLAND
A. B. SWETLAND
E. R. MIXER
LOUIS R. SMITH
H. F. DONALDSON
R. B. BRAMWELL
B. F. REUTHER
HEARD RESPESS
F. M. DUNN
H. W. PERRY
M. D. POWERS
HOWARD GREENE

# 730,000 COPIES

It required 730,000 copies of

THE AUTOMOBILE

to FILL ORDERS during 1905

## No More—No Less

Average Monthly Circulation, 60,833
Average Weekly Circulation, 14,038

Books open for verification of the above figures

## Not Talk—But Facts

NO COMBINATION OFFERS
FREE BOOKS
SOUVENIRS OR CHROMOS

$2 per year, payable in advance

CIRCULATION HAS BEEN BUILT UP
SOLELY ON THE MERITS OF THE PUBLICATION

GUARANTEED AVERAGE WEEKLY
CIRCULATION FOR 1906 . . . . . 15,000

THE AUTOMOBILE

VOL. XIV. NEW YORK—THURSDAY, JANUARY 4, 1906—CHICAGO No. 1

# WOLSELEY 140-H.P. RAILROAD CAR MOTOR.

THE engine illustrated on this page is the six-cylinder horizontal opposed Wolseley motor built for the General Electric Company, and now installed in an experimental self-propelled coach at the principal shops of the company in Schenectady, N. Y. There are a number of interesting features about this motor, which represents the latest English ideas in a prime mover for self-propelled railway coaches. We understand that the order was originally placed with the Birmingham concern for the reasons that no American builder would guarantee prompt delivery of a motor suited to the requirements, and because the Wolseley concern had successfully built explosion motors for the North Eastern Railway Company of England. The motor here described is used to drive a dynamo in a mixed system of propulsion similar to that employed on the English railroad referred to. On builder's test it has developed 140 horsepower at 420 revolutions, and the weight scales at 6,720 pounds. As our readers are aware, the Wolseley Company has long been the exponent of the horizontal motor in England, using this type almost exclusively in their touring cars until recently. Their experience with the type was doubtless a determining factor in employing it in this instance. The exterior of the motor (Fig. 1) shows a compact and clean design in which there is a good balance of proportions and a workmanlike assemblage of piping and connections.

In Fig. 2 the details of construction are shown in the sectioned drawing. The motor was built to work either with gasoline or kerosene. Under the builder's trials using gasoline as fuel, the consumption on a continuous full power trial for three hours was thirty-three gallons; the average brake horsepower was measured as 144.94, giving a fuel consumption of .607 of a pint per horsepower hour. The maximum horsepower recorded during the test was 158.24. Frequent readings of the temperature of the cooling water showed that it remained practically constant at 45 degrees Centigrade.

The engine has six opposed cylinders, three on a side, each cylinder of 9 inches bore and 10 inches stroke. The cylinder castings extend into the crank hamber just clear of the tops of the connecting rod big ends, giving a long trunk bearing for the pistons, which are each fitted with three square section rings. It will be noticed that the cylinder proper is really a liner, seating in the enclosing water jacket in metal-to-metal joints.

The connecting rods are of I section, with marine crank pin ends and round forged wrist pin ends. The valves are located in a concentric combustion chamber in the deep cylinder heads, two inlet and two exhaust valves to each cylinder, all mechanically operated. Camshafts, operated by gears in the usual way, extend lengthwise of the engine on the sides below the cylinders and inside the crankcase. The cams impart

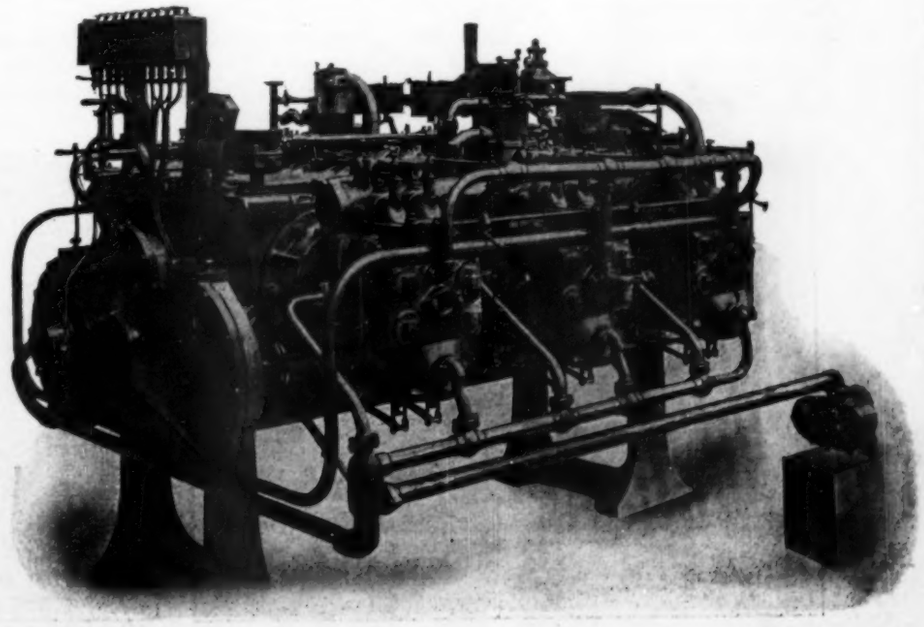


FIG. 1.—WOLSELEY 140-H.P. MOTOR BUILT FOR GENERAL ELECTRIC CO., SCHENECTADY, N. Y.

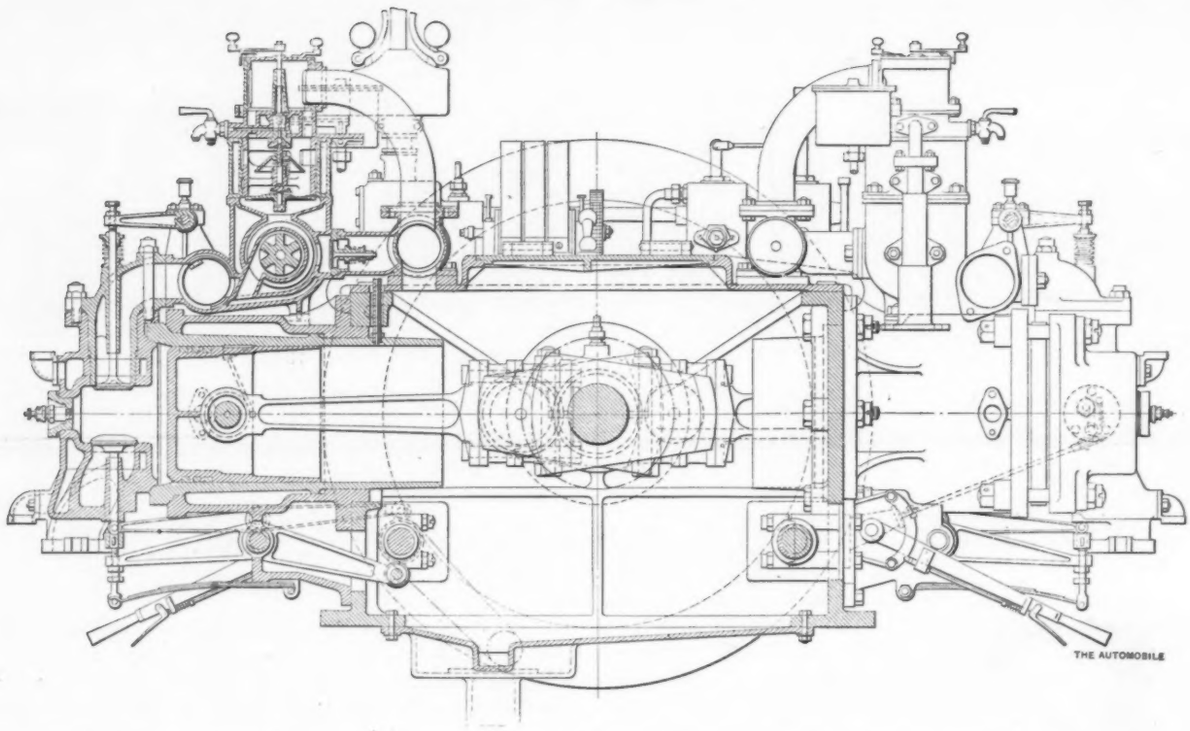



FIG. 2.—TRANSVERSE VIEW OF THE 140-HORSEPOWER 6-CYLINDER OPPOSED WOLSELEY MOTOR, PARTLY IN SECTION.

motion to the rocking levers pivoted below the cylinders, the outer ends operating the top row of inlet valves (by pullrods connected to single arm levers above the valves), and the bottom row of exhaust valves by contact with a stirrup attached to the valve stems. This arrangement can be clearly seen on inspection of Fig. 2. The inlet valves are held on their seats by ordinary coil springs and the exhaust valves by heavy, laminated flat steel springs. Special structural materials are used throughout; the pistons and connecting rods are of tough steel, the crankshaft of high-grade Sheffield steel, the bearings of phospher bronze, inlet valves of mild steel, and exhaust valves having cast-iron heads and mild steel stems.

The lubricating system is very carefully worked out, as would be expected in a heavy engine of this type. All the pistons and main bearings are oiled by pressure feed from gear-driven pumps at the flywheel end of the motor. These pumps draw their supply from the bottom of the crankcase. The rate of flow of the oil to these frictional surfaces is therefore directly proportioned to the speed of the motor. A supplementary system furnishes a drip feed oil supply to the crank pins and all other bearings.

Two carbureters are mounted on the engine, one at each side supplying three cylinders. Two float feed chambers are fitted for each carbureter, one for gasoline and one for kerosene, a three-way cock in the connections permitting an immediate change from one fuel to the other. The air supply is under the direct control of the driver by suitable connections, and this can be drawn either from the crank chamber or from the outside air. The intention of the builders is to usually draw the air supply from the chamber so as to rid it of accumulations of gas and assist in keeping the main bearings cool. Just how this works out in practice we do not know, but it would seem that this method would give a poor mixture in the engine cylinders. A throttle of the rotary type in the induction pipe is controlled by the engine governor. and regulates the volume of fuel.

In a motor of the dimensions of this one some provision must be made for starting other than manually. This is usually done by the aid of a compressed air attachment. In the Wolseley motor the initial turning movement is obtained by the explosion of a gunpowder cartridge in one or more of the cylinders. In the end of the combus-

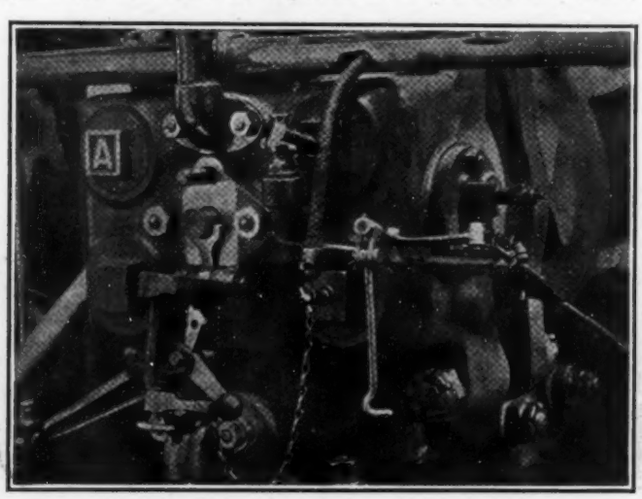



FIG. 3.—STARTING CARTRIDGE INSERTED IN SPARK PLUG OPENING IN COMBUSTION CHAMBER ON CYLINDER HEAD.

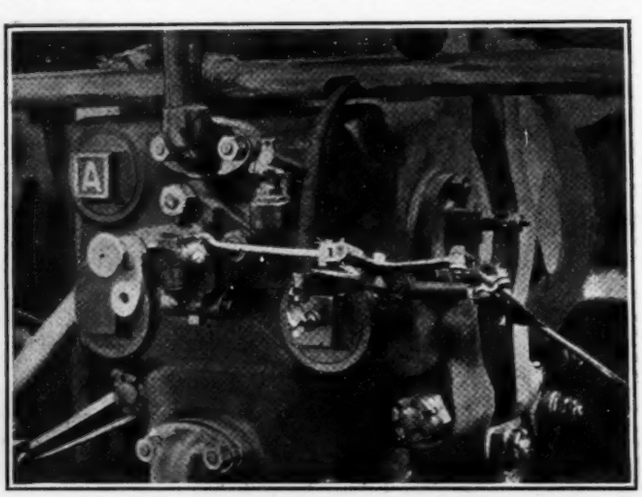



FIG. 4.—BREECH BLOCK CLOSED OVER STARTING CARTRIDGE AND TRIGGER CONNECTIONS IN POSITION.

tion chamber (which is practically the cylinder head) there is a hole for the insertion of the high-tension spark plug, and surrounding this hole, on the outside, is an extension of the casting having a rectangular face. In this hole, when the spark plug and its casing is removed, the powder cartridge can be snugly fitted, the head resting on a hinged extractor, which is clearly shown in Fig. 3. A device known in gunmaking as a "breech block," is hinged to the rearward of the extractor and contains the firing pin. After the cartridge is inserted the breech block is swung upward and locked in place by a nut on a suitable stud. This position is seen in Fig. 4. The striker is cocked and held ready to fire by a trigger which is connected by rods and links to the low-tension ignition tappet rods, by which it is tripped—the motor is fitted with double ignition. Usually three cylinders are so

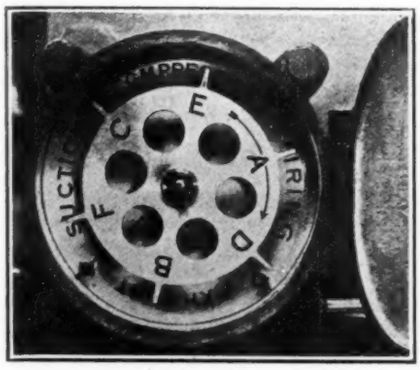


Fig. 5.—Indicator Showing Condition of Cycle in All of the Cylinders.

"loaded," and the first is fired by hand, the two others going off automatically as the low-tension apparatus commences to function.

The cartridge is an ordinary metallic blank filled with 300 grains of black powder, giving a pressure on ignition equal to about one-half the working pressure in the cylinder. The explosion is not supplemental to the ignition of a regular gas charge in the cylinder, as before firing the exhaust valve of the cylinder is lifted by hand, allowing the contained pressure (if any) to fall to atmospheric. After the motor is running the breech block and cartridge case can be removed and the former replaced by a hinged casting which carries the regular spark plug.

It will at once be seen that the driver must know which of the cylinders is ready for firing before he loads it with the cartridge or else a back kick would be as likely as not to happen. For this purpose a mechanical indicator is fitted to the motor, showing at a glance the condition of the cycle of operations in each cylinder. The face of the indicator is seen in Fig. 5. Each letter on its face corresponds with a similar letter stamped on a plug in the cylinder head. If it should happen that no piston was in the correct position for firing, the motor would be pinched around until one of the cranks stood at about 20 degrees past center on the explosion stroke.

The starting cartridges need not be removed if the motor is run on the low-tension ignition system, as of course they are gas-tight after they are locked in place and fired. When the motor was built a good deal of experimentation was carried on to discover any weakness in this starting system. The builders state that there was not a single case of failure to start. The system takes longer to describe than to actually operate.

We understand that the motor has been very thoroughly tested by the General Electric Company, and has been found highly efficient. The workmanship is very fine, and the design apparently the result of much experience in explosion engine work. No doubt later some public demonstration of the mixed system adopted by the General Electric Company will be made. It is the intention to couple the engine direct to a generator furnishing current to the car electric motors. Its performance on the rails will be watched with interest by automobile engineers.

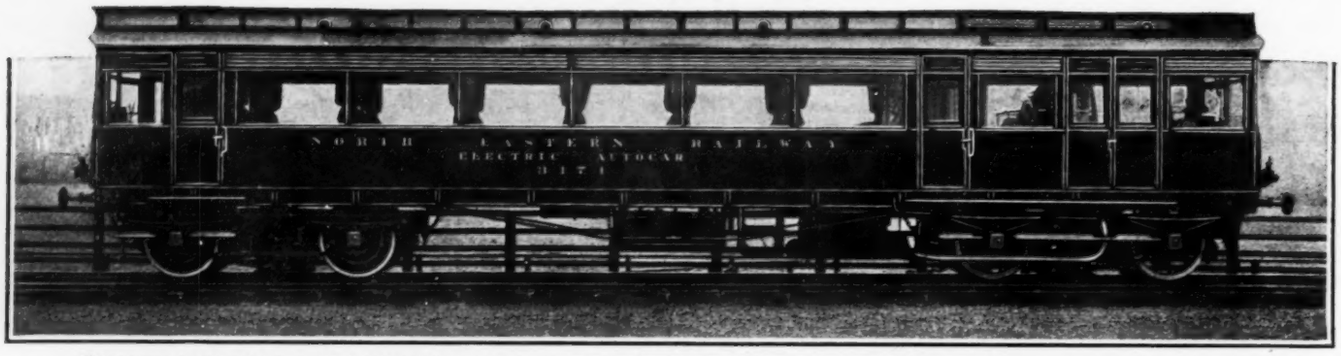
# British Railroad Automobiles, and Motor 'Buses Used as Steam Road Feeders.

LONDON, Dec. 5.—Recognizing that the general adoption of automobiles and motor trucks is only a question of time, the British railway companies have overcome their feeling of opposition and are now running automobiles of their own. Naturally enough, the adoption of any innovation of this sort takes time, for extensive trials of the value and practicability of the new idea must be made, but now the period of probation is passed, and in a very short time the automobile department will be an acknowledged branch of the railway organization. Automobiles for this work fall naturally into two classes: those used on rails and supplementing or replacing the ordinary trains, and those running on the public roads and acting as feeders to the railway.

### Automobile Cars on Branch Lines.

The first of these two classes has a wide scope for operations. In every railway system there are always branch lines on which there is but a small traffic that does not pay for the existing steam service, but to encourage development of the traffic the management may decide to run a frequent service of trains and the receipts may be altogether disproportionate to the running expenses. Here the railway automobile enters and exactly fulfills the requirements. Small auto coaches—with or without a trailer, according to fluctuations of traffic—can be run on the same schedule as the steam train at a greatly reduced cost, and yet be all that can be desired as regards carrying capacity and speed. The old train required a heavy engine—heavy because it is not worth building specially light engines for this light traffic—and generally three or four coaches to insure steadiness. The locomotive is not economical for light loads, and even when not actually running is consuming fuel. On the other hand, the automobile car is compact and light in weight; generally the driver can dispense with the assistance of a fireman, and if the coach has a gasoline engine no fuel is being consumed except when running. Being light, and easily slowed down and accelerated, frequent stops

DOUBLE-DECKED GASOLINE OMNIBUS, USED BY GREAT WESTERN RAILWAY OF ENGLAND.




GASOLINE-ELECTRIC RAILROAD MOTOR CAR, EQUIPPED BY WOLSELEY FIRM FOR THE NORTH EASTERN RAILWAY OF ENGLAND.

can be made economically and passengers can be picked up at other points than the regular stopping stations. In many other details the railway automobile surpasses its rival, and without doubt the new method will be soon in general use on branch lines with light traffic.

### Great Western Steam Coaches.

As regards motive power for these cars, the railway companies naturally incline towards the use of steam, and most of the carriages already built in England use this for propulsion. Many of the English railways are now experimenting with various types of carriages. Perhaps the Great Western Railway Company has made the most progress. This company has already almost thirty automobile services in operation, mostly on branch lines, and many more are in contemplation.

The cars are built at the company's works at Swindon, and the two classes are known as "suburban" and "branch" carriages. The "suburban" carriages are designed to serve urban districts, in which provision has to be made for a large population, and where the journeys are generally of short duration. The carriages are fifty-nine and seventy feet in length, with the motor compartment occupying the first fourteen feet and the remainder divided into compartments for smoking, and non-smoking passengers. There is accommodation for fifty passengers, and no distinction of class is made. The power plant of the carriage is amply powerful for hauling two, or even three, trailers in case of sudden increase of traffic. Vestibule doors at the ends give access to the interior, and the seats are placed crossways in sets of three. Motive power is provided by a steam engine with two horizontal cylinders, 12 by 16 inches, supplied from a vertical multitubular boiler. Hand and vacuum brakes are fitted, and these, together with the engine, can be controlled from either end of the car; in fact, on the latest models with trailers, control can be effected from the trailer, thus retaining all the advantages of a single vehicle.

The "branch" carriages are intended for longer distances and are made larger and more comfortable inside. Distinction is made between first and second-class passengers, with accommodation for about forty of each. The usual fares charged are the same as on the main lines: two pence per mile first class, and one penny (two cents) per mile second class.

### North Eastern's Gasoline Cars.

There seems likely to be an advance in popularity of gasoline-driven railroad cars, although not much has been done in this direction as yet. The North Eastern Railway Company has now been running for more than a year a carriage of the gasoline-electric type with great success. A four-cylinder horizontal Wolseley engine of 80 horsepower is employed, and this is coupled direct to a dynamo. The current from the dynamo drives two electric motors geared direct to the front wheels. A speed of about thirty-five miles an hour is attained, and although the indirect means of driving may not be so economical of power as a steam or gasoline motor driving direct, this method results in great smoothness of running and ease of starting. When the carriage stops the engine is kept running to charge up the storage cells used for lighting up at night. [This car was illustrated and described in The Automobile of April 30, 1904.—Ed.]

### Great Northern Type.

Another type, which more closely follows accepted automobile design, is in use on the Great Northern Railway, near Hertford. Two engines—36-horsepower four-cylinder Daimlers—are fitted, and these drive through a gear box with sliding gears to the rear axle. This arrangement seems to give entire satisfaction, and will, no doubt, be adopted on other lines.

### Auto 'Buses As Railroad Feeders.

Turning now to the second class of railway automobiles, we come to what is more nearly the actual province of the automobile. As feeders to railways, the automobiles—known here generally as motor 'buses—have a wide sphere of usefulness, and their adoption has been very general and extensive during the past year. These services, which, by the way, are greatly appreciated by the residents of the districts served, afford vastly improved facilities for travel in places where even a light railroad would not be worth constructing. The thickly-populated districts of England have begun to be overrun with town-to-town electric car services (there are hundreds of miles of these in South Lancashire alone) which monopolize the greater portion of the highways and disfigure the face of the country with rails and unsightly overhead wires. If the motor 'bus does nothing more than check this growing nuisance, it will have conferred a favor upon civilization.

The 'buses used for these 'bus lines are of many types, and are in general propelled by gasoline motors. The principal exception is the Clarkson, which has a steam engine supplied from a kerosene-fired flash boiler. The noiselessness and ease of starting of these vehicles is greatly in their favor, but as the gasoline cars are improved they will tend to rival the steam car in these particulars.

### Types of Gasoline 'Buses.

The gasoline auto 'buses have, in general, a four-cylinder 20-30-horsepower engine, running at about 1,200 revolutions per minute, and have four speeds and reverse, turning the drive wheels by either shaft or chains, the former method being perhaps the more common. Two types of ignition—magneto low tension and high tension with coil and battery—are used in conjunction to avoid chance of delay through ignition troubles. Solid rubber tires are usual on all wheels, and the makers of these tires seem able now to make an article that is fairly reliable and satisfactory.

The bodies, of course, vary greatly, but the usual type is double decked, seating about sixteen inside and eighteen outside, besides driver and conductor. Provision is also made on some for carrying goods and mails. The average rate of travel is twelve miles an hour, and the 'buses are run on a regular schedule, generally in conjunction with the arrival and departure of trains. About eighty to 100 miles is the daily mileage for one of these 'buses, and the total running cost, including tires and renewals, is about nine pence to eleven pence (eighteen to twenty cents).

Such vehicles as these have been running continuously for a year or more and no vital replacements are yet necessary. As to their utility and commercial success, there is no question; the enormous growth in their use that has been noted in the past few months testifies to the great future before the railway automobile.

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"It takes a lot of patience to run an automobile, does it not?" asked the man. "Yes, lots of patients," replied the doctor; "and I've got 'em."—Yonkers *Statesman*.

## Chicago & Alton Making Tests.

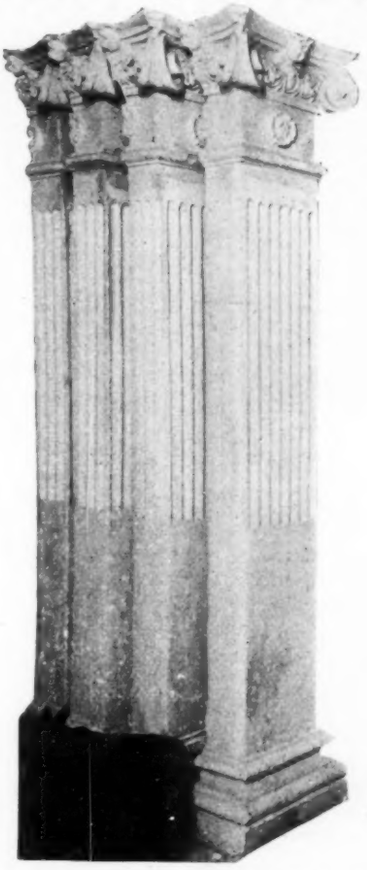
CHICAGO, Dec. 30.—The Chicago & Alton Railroad Company made a thorough test of a gasoline railroad car on Wednesday and the results were so satisfactory that the officials intend to use this type of a car for suburban service between various points in the state for the purpose of competing with the electric lines.

In the test, during which the car was run from Jacksonville to Alton, Ill., a distance of sixty-six miles, a speed of forty-five miles an hour was attained. The car was loaded to its capacity. Several similar cars will be ordered and will replace the steam trains in the interurban service between Springfield and Carlinville, Springfield and Lincoln, and Bloomington and Pontiac, in Illinois.

The Chicago & Alton company had previously experimented with light trains hauled by small steam engines, but they did not fully meet the requirements of the situation. Believing that a car propelled by gasoline would probably meet the need for short trips at high speed with numerous stops, a special type of a motor car was designed and constructed. This was the car which went through the test on Wednesday.

It is built of steel, which safeguards the passengers, especially against telescoping. Its lines resemble those of an inverted boat, the roof being rounded and the car tapering to a sharp edge in front and being rounded off at the rear, to reduce wind resistance and dragging suction. The construction is very similar to that of the Union Pacific motor cars. In weight it is 56,000 pounds and the car will accommodate fifty-seven persons. There are two four-wheel steel trucks—the driving wheels being 42 inches in diameter and the others 34. The car is fifty-five feet in length.

The engine, which is a 100-horsepower, six-cylinder gasoline engine, built on special railroad patterns, is cooled by water circulation with coils. It has a make-and-break spark ignition, with a primary battery for starting and a magneto for running service. The air-brake valve lever and the emergency spark cut-off enable the driver to stop the engine and put on the full brake power in half a second. Eight cells of battery supply the spark current. The engine drives to the axle by means of a special chain.



STAFF PILASTERS FOR THE GARDEN SHOW.

The car can start on high speed, direct connected, without the use of gears, on the level or on a grade of 1-2 per cent. On steeper grades the speed gears are used. A muffler silences the exhaust.

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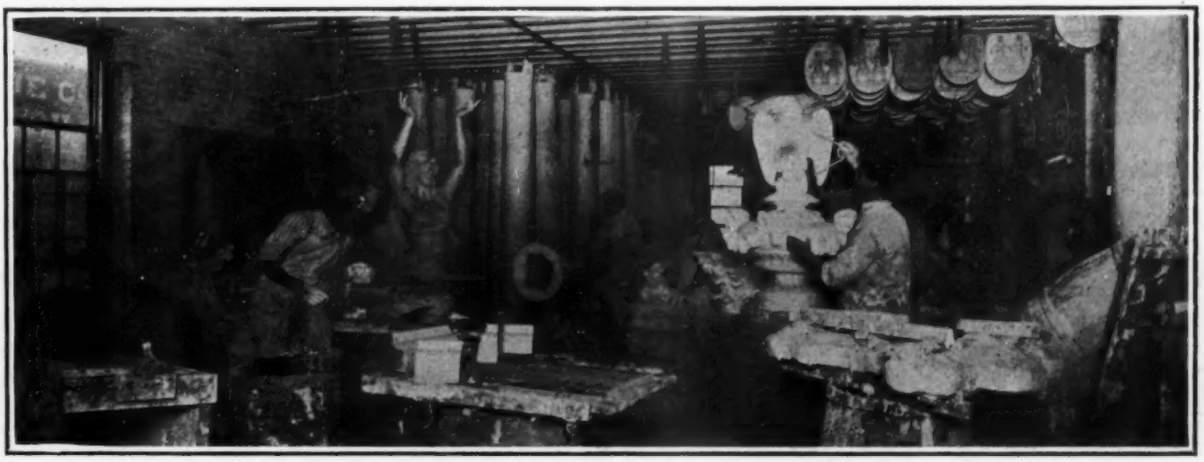
**Many foreign** chassis are now being offered abroad with either long or short wheelbase, and frequently the purchaser is given an option on chain or shaft drive.

## Preparing for Show Opening.

Preparations for the Madison Square Garden Automobile Show are already well under way, and much actual work has been done, notwithstanding the fact that the great building is now the scene of a poultry show and that the automobile show will not be opened until January 13. A great deal of the decorative material, such as the staff work, is being prepared in studios, and when the decorators take possession of the building, probably on Monday, January 8, there will be an abundance of material ready to put in place. The time between that date and the opening of the show will be none too long to complete all the details of the elaborate decorative scheme. A description of the plans for decoration was given in THE AUTOMOBILE for December 14; the illustrations given herewith give an idea of how the work is being done and what some of the details will look like. It is evident that those to whom an automobile show in Madison Square Garden has become a familiar scene will find a very different Garden for the 1906 show.

Practical demonstrations of cars will be an important feature of the show of the Automobile Club of America in the new armory of the Sixty-ninth Regiment, on Twenty-sixth street, near Fourth avenue, New York; manufacturers are arranging for a great deal of work of this kind, realizing that actual work is the real test of the car. Work on the building has progressed with such rapidity that exhibitors will be admitted to commence preparations on Wednesday, January 10, instead of on the following day, and will be required to have their work completed and exhibits in place by 1 o'clock P. M. Saturday, January 13, in order to allow time for a final cleaning up and for a private view by club members and their guests before the show is opened to the public at 8 o'clock P. M. Decorations will be confined to the stands, the promoters believing that the public will desire to see the architectural features of the splendid new building. The stands, however, will be most harmoniously decorated.

(*Continued on page 21.*)



ARTISTS WORKING ON STAFF DECORATIONS FOR MADISON SQUARE GARDEN SHOW.

# 1906 MODELS AT THE PARIS SALON.—II.

By RENE M. PETARD.

DARRACQ'S extensive and largely extended stand contains as its most noteworthy exhibit Hemery's winning racer, and a polished chassis, in which very few changes have taken place since last year. In fact, the only changes made are betterment of details going towards simplification in manufacture and increase in strength without affecting in any way the general factory routine.

A clever fan belt tightener is shown in Fig. 1, in which the fan spindle *S* is excentrically formed on a hexagon disc *D* integral with a large diameter screw *V*, which is hollowed out for lightness. This screws into a box *B* carried in front of the engine in a permanent position. By screwing *V* in and out of *B* the disc *D* rotates and spindle *S* is brought nearer or further apart from the crankshaft which carries the driving pulley, thus tightening or loosening the belt, as may be desired. A locknut *L*, which rests against the box *B*, is used to secure the screw in its desired position.

The frame of the 1906 car is raised at the rear and at the same time bent inwards, so

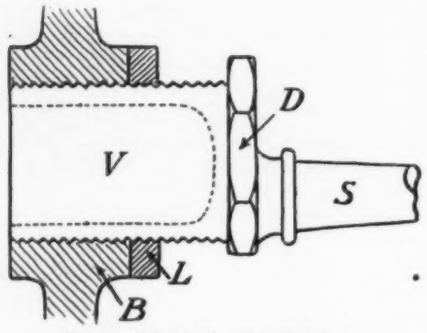



Fig. 1.—Darracq Fan Belt Tightener.

as to allow the machine to stand very low on the ground. Double ignition is fitted as a standard to all models above 40 horsepower, the latter included.

In the models exhibited by the old house of Peugeot, the engine is found to be quite low in the frame, the valves being symmetrically placed on each side of the cylinders and their pipe connections being carefully thought out to insure efficiency and ease of access to all parts of the motor. The new Peugeot carbureter is fitted, which, although on much the same principle as that of last year, is considerably simplified. No heat is supplied to this carbureter either by the exhaust or the water circulation, the same being the case with the Renault apparatus described in the previous article. In the Peugeot carbureter (Fig. 2) a large chamber *A* is formed which freely communicates with the warm atmosphere under the bonnet. By means of large holes, a valve *V* riveted on a stem *T* rests against a projecting edge *E* between this chamber *A* and the mixing chamber *M*, a spring *S* keeps this valve normally in contact with its seat. The other end of the stem *T* carries a piston *P* working in a cylinder *D* formed in the carbureter casting, the space between this piston and the bottom of the casting forming a dashpot intended to prevent the sudden fluctuations of valve *V*. The nozzle *N* stands vertically a little distance from *V* in the mixing chamber. This nozzle is of a rather peculiar shape and consists of a piece of bronze of the shape shown in Fig. 3, bored out centrally almost up to its top and slotted on the side as shown at *F*; of course, the sketch is very much magnified. The slot *F* consequently forms the outlet for the spray of liquid fuel caused by the suction of the motor. A cap *C* (Fig. 2) is fitted in a slide above the nozzle, and has its lower end cut down at an angle. This cap is almost a fit over the nozzle, although its size is exaggerated for clearness in the sketch. When the motor is running the valve *V* is opened to a certain extent by the suction, this opening varying with the speed of the motor; thus the quantity of air supplied is regulated. The cap over the nozzle

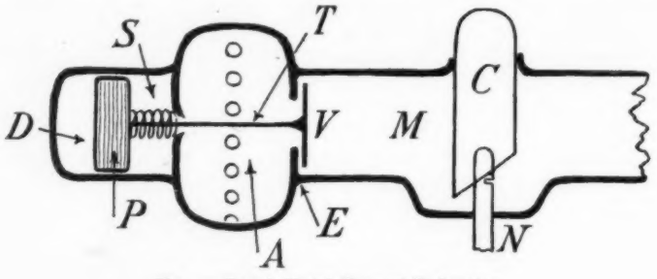



Fig. 2.—Rough Sketch Peugeot Carbureter.

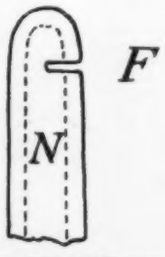


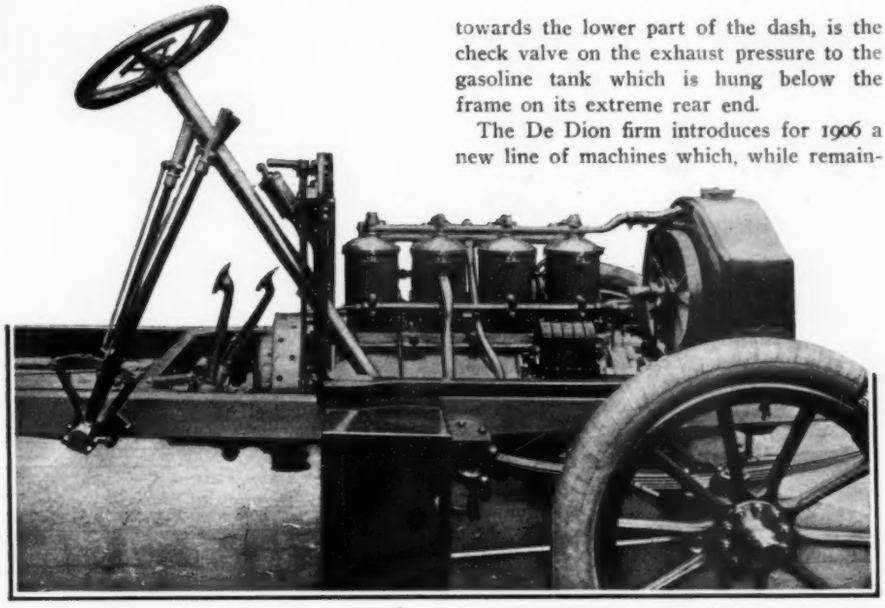

Fig. 3.—Peugeot Nozzle, Exaggerated in Size.

is slidably mounted over the nozzle, as was already stated, so that by connection with the throttle, if the latter is altered in its setting, the cap will either go up or down over the nozzle and thus its leveled end will cover up more or less of the spraying slot. Suitable links are used to connect cap *C* with the throttle. The object in thus regulating the delivery of the fuel as well as the air is the same as that mentioned when describing the Renault connections on the mixture delivering system; viz., to correct the imperfections of any automatic carbureter purely based upon suction phenomena.

The Peugeot machine as a whole is very carefully thought out and the entire system is of great strength. The sub-frame, which carries the engine and gear box, is hung from both ends to cross members on the frame, while a sheet steel web comes down from the frame sides to the sub-frame on its entire length, reinforcing both the frame and sub-frame and affording protection for the machinery. The drive on the large machines is by chain, the differential and bevel gears system is well designed, bearings being provided on both sides of every bevel wheel. Ball bearings are used throughout except in the engine.

Passing to the firm of De Dietrich, we find on this stand a chassis that in its general lines has not been much altered from last year except that the engine is an entirely new one with this concern. It has four cylinders, cast in pairs, but instead of having the inlet valves on top and operated by overhead tappets, as was the case last year, the eight valves have been brought to the same side of the engine and are all operated directly by a single camshaft driven by inclosed gears in front of the engine. This method of placing the valves is very advantageous when cost of construction is considered, but to the user it frequently presents the disadvantage of making the motor inaccessible on the valve side. The array of pipes which it makes necessary on the valve side covers usually covers almost completely the valve stems and springs, making a repair a difficult as well as a hot job, around the exhaust pipes, when the motor has been running.

In the De Dietrich engine, however, this trouble has been practically eliminated in a highly skillful manner, the arrangement of piping, as shown in the photograph on page



MOTOR END OF FOUR-CYLINDER DE DION CHASSIS AT PARIS SHOW.

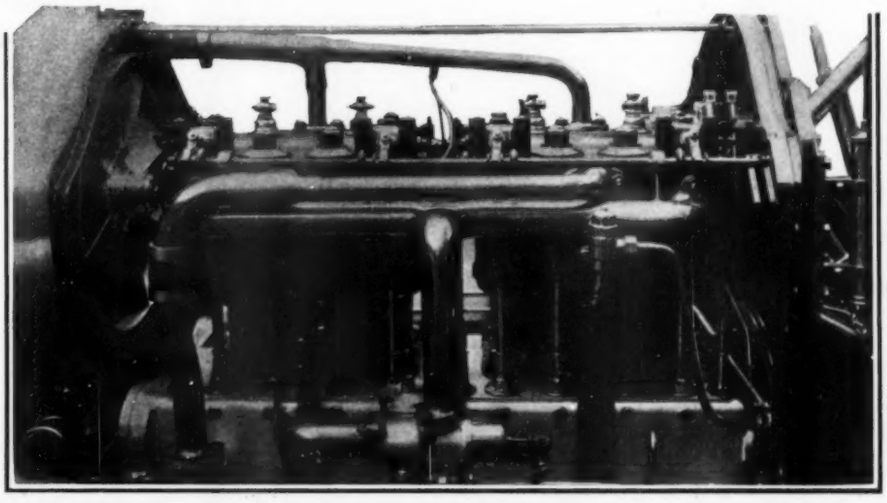
towards the lower part of the dash, is the check valve on the exhaust pressure to the gasoline tank which is hung below the frame on its extreme rear end.

The De Dion firm introduces for 1906 a new line of machines which, while remaining much within the same powers as formerly, however, presents a number of interesting novelties. Their efforts have been towards maintaining their reputation as to simplicity and ease of upkeep, while nevertheless adopting a number of the most up-to-date features of the other cars on the market. They still preserve their excellent and old tried system of rear axle drive, with suspended differential and transverse cardan shafts, now known the world over, while their experience of the past season with the disc clutch, which they introduced at last year's show, has caused them to preserve this system this year with a few improvements.

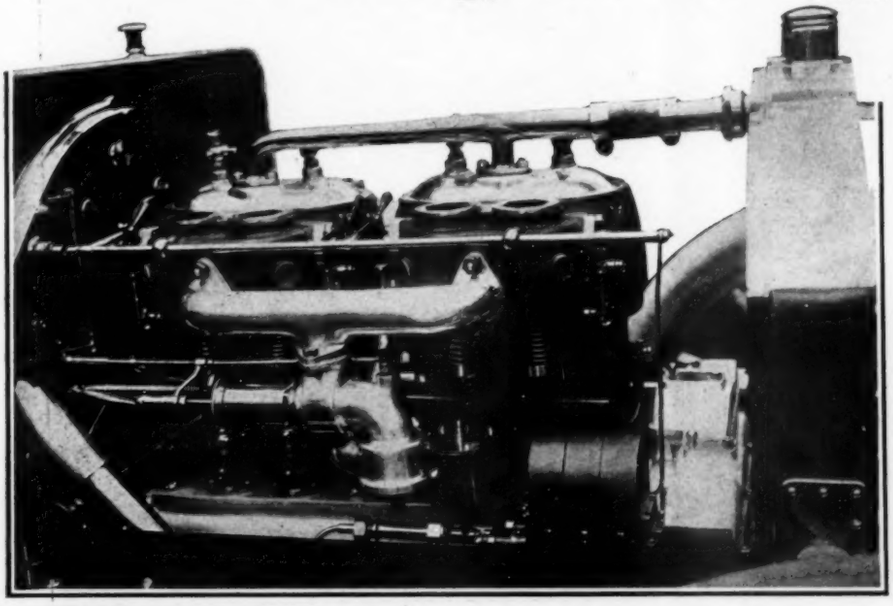
This clutch, which they now put on all their machines, except the single cylinder, 8 horsepower, is excellent on account of its silence, smoothness of operation and ease of upkeep. The slight trouble which was sometimes experienced last year was mainly due to the graphite plugs which were inserted in the friction discs and which shedded small particles and flakes between the contact surfaces which caused slipping. This is entirely done away with this year. The friction plates are now made out of a special friction alloy which is almost self-lubricating and which, at any rate, does away with graphite entirely.

7. being extremely neat and simple. The exhaust is led straight down from the central pair of valves of each cylinder casting, while the inlet pipe, which leads to the other four openings, is quite high near the top of the motor, and entirely out of the way, the water inlet pipe being right above it and delivering its coolest water just upon the exhaust valves chambers, where it is most needed. The pump being of very large size, the exhaust is always relatively cool and the motor is quite silent when running.

Ignition is by a high-tensio magneto as a standard, but double ignition can be fitted if desired. The heat for the working of the carbureter is taken from the outside of the forward exhaust by the air inlet pipe to the carbureter. The small appliance shown in the photo on the side of the rear pair of cylinders, and fitted with a pipe leading



DE DIETRICH MOTOR VALVE SIDE.—NOTE THE CLEAN LAYOUT OF PIPING WITH ALL VALVES ON THE SAME SIDE.



INLET SIDE OF DARRACQ MOTOR, SHOWING CARBURETER, MAGNETO AND LOW TENSION IGNITION MECHANISM.

All sizes of cars are now fitted with three speeds and reverse, while the 24-horsepower size is possessed of four speeds. In outside appearance the machines have all felt the influence of the presence of last year's intruder: the four-cylinder machine. The steering pillars are now set at a better angle for the driver's convenience, the tubular frames are entirely ousted by the pressed steel ones, the front axles are not any more tubular, but are made of forged steel, while the clutch pedal is removed to its usual position adopted by the other makers—under the left foot. On the four-cylinder models 15 and 24 horsepower, the operating levers are placed above the steering wheel, increasing the driver's comfort, and the radiator is

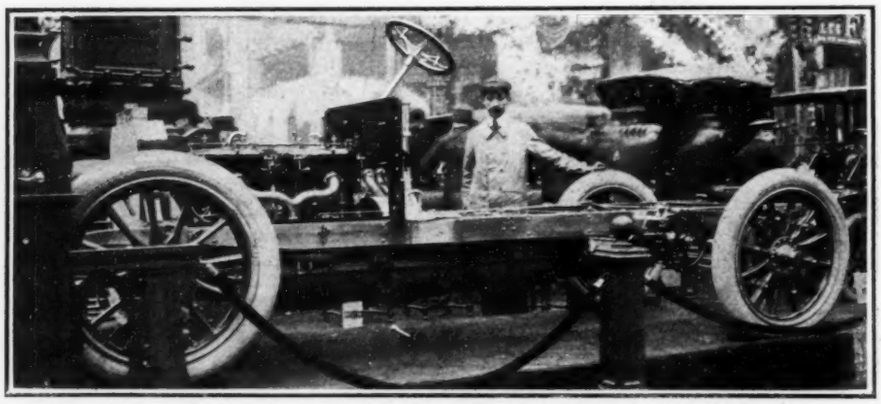
brought up above the frame under the now generally adopted type of hood, a fan being fitted to assist its cooling. Double ignition is now fitted even to the two-cylinder motors with a high-tension distributer. The system includes a low-tension magneto, a battery and a single coil, for any number of cylinders.

On the C. G. V. stand one finds two entirely distinct types of chassis: the 14-horsepower town car chassis, not built for touring or for road driving, and the ordinary touring cars of 24, 40 and 75 horsepower, all the machines being four-cylinder.

The town car is fitted with live axle drive and Cee springs. The engine has all its cylinders cast in one piece. The touring cars are chain driven, the countershaft being distinct from the gear box in the heavier model. The town machine engine has all its valves on the same side over a single camshaft, the second and third valves and the sixth and seventh being inlet valves, the others being exhaust. Ignition is by high-tension magneto and the carbureter is the usual C. G. V.

The change speed lever is peculiar, inasmuch that there is no trigger or push button operating a latch, and that one has simply to push it back and forth to change speeds. In Fig. 4 the lever is shown in horizontal section at *L;* it carries on its side a small tooth or catch *C* riveted and brazed to it, the sector on which the lever works is placed alongside of it, and instead of being notched on its edges, is notched on its sides; it is slidably mounted at both ends upon studs *N* screwed home on brackets *B*, a strong coil spring *S* constantly pushing the sector against the lever. When the lever is actuated by the driver, after an effort to push the sector sideways against the springs on account of the V shape of the notches, the push of the same springs will bring the sector back in place when the lever comes opposite to the next notch, thus stopping the driver, unless he furnishes another effort to again overcome the spring pressure.

In the touring car models the valves are symmetrically placed on each side of the engine over two camshafts actuated by inclosed silent gears. The change speed gear is as in the touring models, a cam actuated, two sliding sets system, and gives four speeds and reverse, with direct drive on top gear. The countershaft brakes are exceptionally large, being about 16 inches in diameter and completely inclosed. They are of the cam actuated, expanding type. The clutch is still of the cone and leather type.



CHASSIS OF 50-HORSEPOWER PEUGEOT CAR AT PARIS SHOW.—NOTE REMOVABLE PAN BENEATH THE MOTOR AND TRANSMISSION.

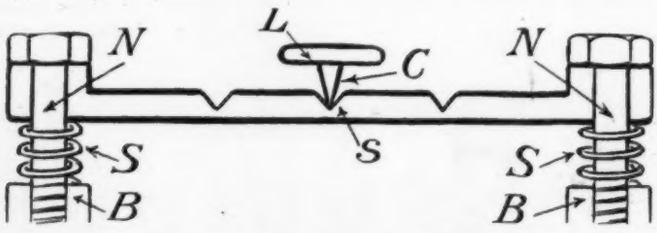
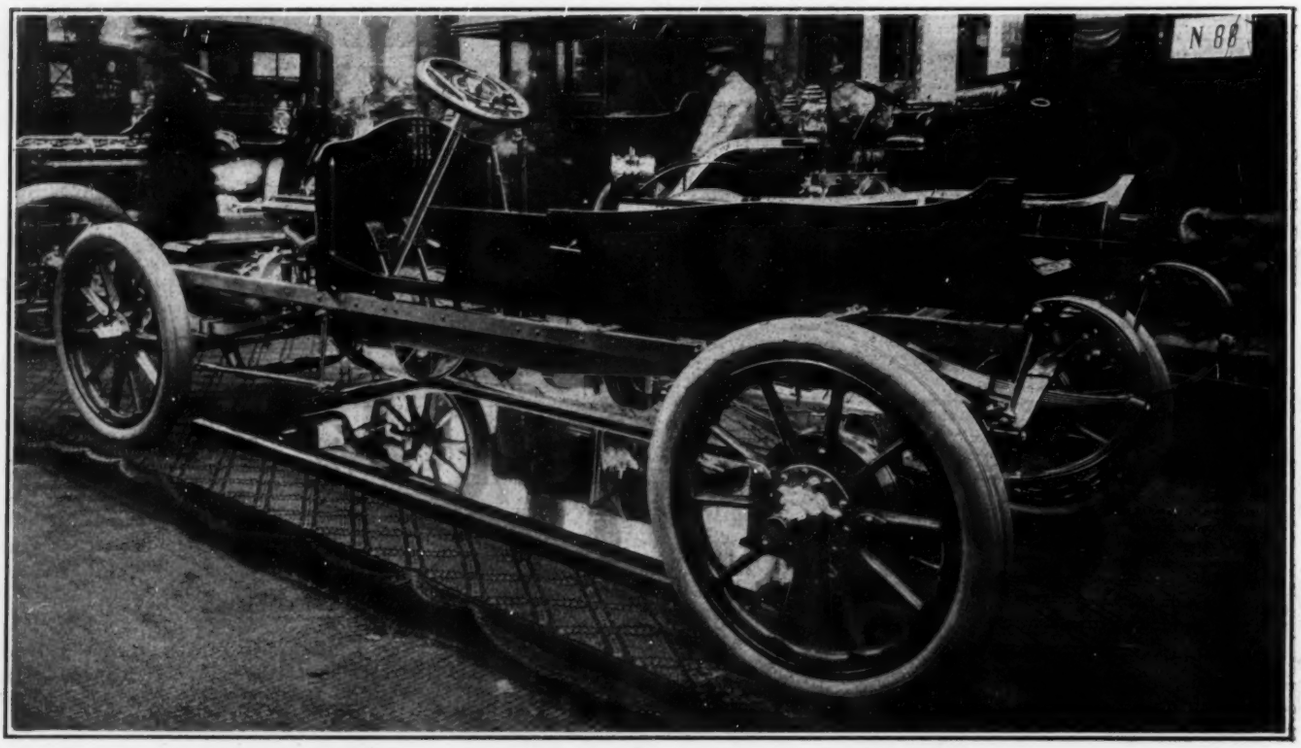


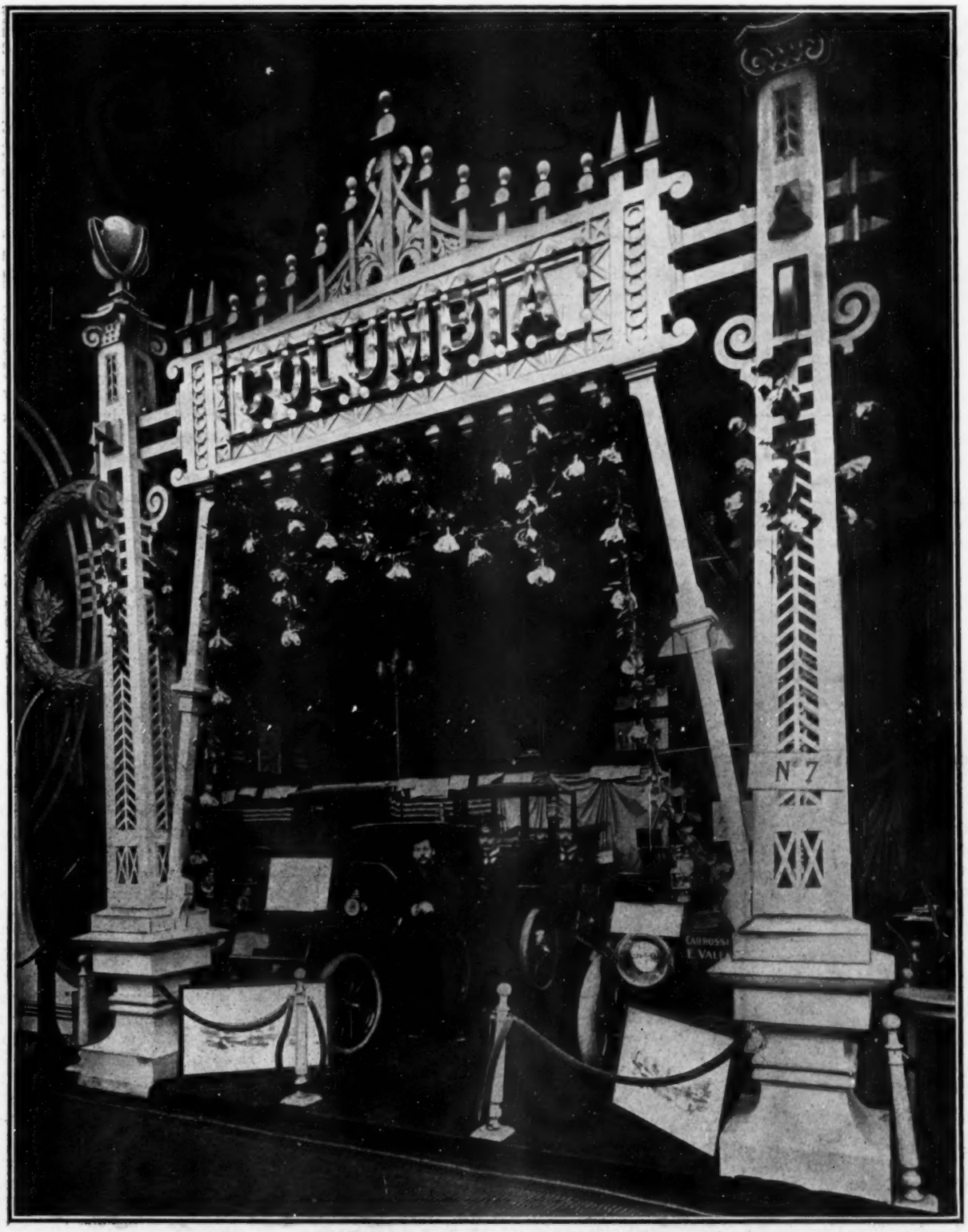

Fig. 4.—C. G. V. Change Speed Device.]




C. G. V. CHASSIS, WITH STEERING PILLAR AT LEFT AND CONTROL LEVERS IN CENTER OF FRAME—NOTE THE PECULIAR TRIPLE SPRING REAR SUSPENSION.

The engine is unchanged either in its general lines or in its construction; it, however, is now regularly fitted with high-tension magneto ignition—with double ignition if desired. The radiator and hood keep their usual C. G. V. shape.

The Brazier cars have been considerably altered since last year. A special description of them having already appeared in THE AUTOMOBILE, which exactly describes the models shown at the Salon, it will be unnecessary to dwell upon them here.




ORNATE STAND AT THE PARIS AUTOMOBILE SALON EXHIBITING COLUMBIA ELECTRIC CARRIAGES, BUILT BY THE ELECTRIC VEHICLE CO. AT HARTFORD, CONN.

The Berliet cars, which count among the very best French machines at present, are made in Lyons, a center from which come to the show a number of excellent machines, produced by several factories. These builders seem to have a private competition all to themselves as to who will have the finest chassis in simplicity or in "admirably good complication," as well as in good appearance. The Berliet frame is of pressed steel, narrowed at the front. The motor is bolted to the frame sides and is a

four-cylinder, cast in pairs, with interchangeable valves, all mechanically operated. The ignition is by make and break magneto, of the Sims-Bosch make. The engine is fitted with a centrifugal governor acting upon the throttle. The radiator is honeycomb, and the water is circulated by a centrifugal pump, the air draught being produced by fan blades formed by the arms of the flywheels. The clutch is the old Berliet metal-to-metal type. Four speeds and a reverse are provided. There are two separate brakes, each independently actuated by its own pedal on the differential, while a third brake is supplied by the hand lever which expands two hub brakes in the rear wheels sprocket drums, the drive being through side chains. Ball bearings are fitted throughout except in the motor.

The American Locomotive Co., which acquired the American license for this machine, has a stand in the main hall, not far from the Berliet stand, in which is exhibited a machine presumably made in America, and which reproduces exactly the original Berliet except, perhaps, for the hub caps.

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**During** the past year the sum of $112,000 has been expended by the government of Porto Rico in improving the highways of the island, the most famous of which is the Military Road, which connects San Juan and Ponce.

# Brakes of Various Types and Their Use.

By MAURICE PARDET.

OF the greatest importance in an automobile is the ability to quickly check the vehicle's speed, or to bring it to a stop when necessary in the shortest possible space; and the importance of brake efficiency increases as the speed of the car increases, reaching the maximum in the swift racing car, in which the speeds obtained are abnormal.

Braking effect is commonly obtained in an automobile by friction, the energy stored in the moving vehicle being converted into heat at the contact surfaces of the brake. Friction is usually obtained by causing a fixed band or ring to contract upon or expand within a drum, setting up more or less friction, according to the pressure used in bringing the surfaces together; the energy required to bring the surfaces together is usually supplied by the driver of the car, through a lever or a pedal, though there are in use several mechanical devices for doing this work, some of which are extremely ingenious.

### Types in Earlier Days.

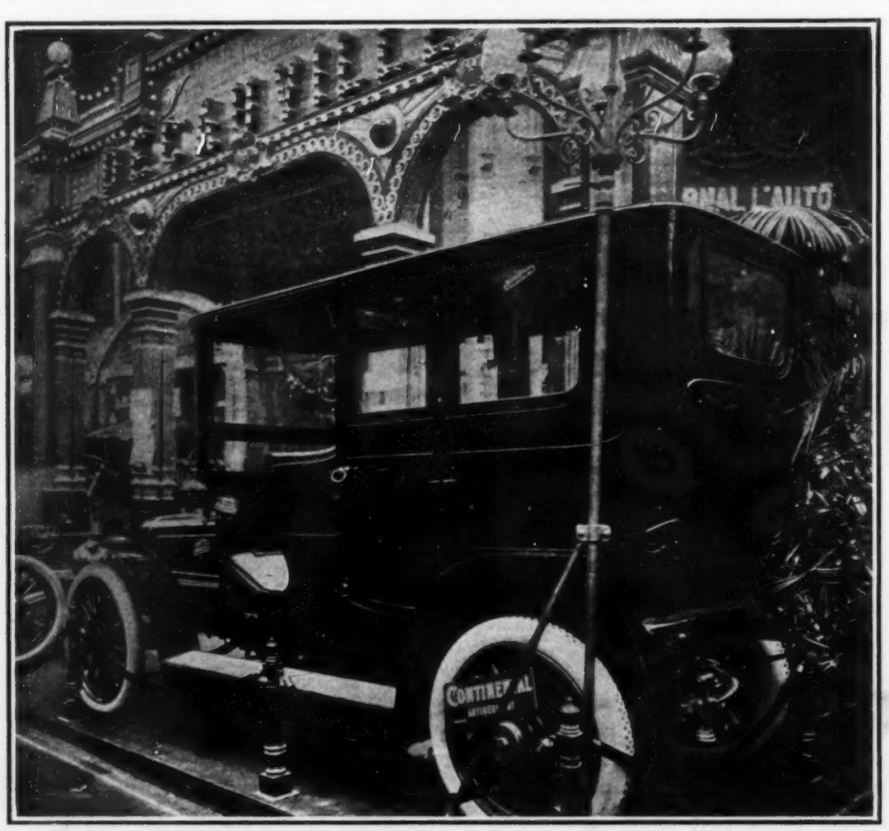
We must look to the builders of horse-drawn vehicles for the principles of many forms of brakes that were used on the early French automobiles. Among the brakes in use before the automobile became a practical vehicle was the Lemoine brake, extensively used in the French artillery and also on the omnibuses of Paris. The Lemoine brake utilized the traction of ropes wound around a drum to apply an ordinary shoe brake to the tire of the wheel. When the brake was idle the ropes were loose on the drums; tightening the coils caused them to have a tendency to travel around on the drums. The free ends were attached to a brake beam carrying the brake shoes, so that the pull of the rope on the drums drew the shoes against the tires. This was an exceedingly powerful brake, but lacked a very important feature—it would only work when the vehicle was moving forward. Also, it was of no use when the wheels were not revolving, as the pull on the ropes was dependent upon the revolution of the drums.

The present custom is to produce braking action either by tightening a fixed band on the surface of a revolving drum, or by expanding a band or jaws against the internal surface of a hollow drum fixed on the shaft or wheel, the brakes acting equally well whether the car is going forward or backward. The brakes should have sufficient frictional resistance and sufficient strength to stop the car within the shortest possible distance, as the speed of which modern machines are capable makes quick stopping very necessary. The distance covered by the car, after the application of the brakes, before it comes to a stop will evidently be proportioned to the initial speed and the weight of the machine, as well as the friction of the brake.

### Maximum Braking Effect.

The maximum useful braking effect is that which will stop just short of causing the wheels to slide without turning. It is not a difficult matter to lock the wheels of most cars so that they will slide along the road; but tires suffer severely from the friction with the road, and, moreover, as soon as the wheel begins to slip the braking action is considerably lessened and there is a strong tendency for the rear wheels to slew around sideways. The pressure required on the brake varies, however, with the speed of the car, for the reason that the higher the speed the smaller the coefficient of friction in the brake.

Extensive experiments made by Douglas Galton show that at circumferential speeds corresponding to twenty miles an hour and fifty miles an hour the coefficients of friction vary in the ratio of 2 1-2 to 1. Therefore, in order to produce the same frictional effect, the pressure on the brake must be 2 1-2 times greater at fifty miles an hour than at twenty; the pressure must be decreased as the speed decreases, for if this is not done the friction, increasing as the speed decreases, will soon lock the wheels. This shows how necessary it is to have brakes that are easily and accurately controlled, and that no slight degree of skill and judg-



**DECAUVILLE CAR AT PARIS SHOW WITH CONVERTIBLE LIMOUSINE BODY BY AUDINEAU.**

**The sides are readily removable by unscrewing bolts inside which are hidden by the upholstery, thus transforming the car into a double phaeton with fixed dash and extension top. When the sides are removed, padded arm rests are placed over the grooves so that there is nothing to indicate that the car was ever anything else than an open vehicle. Distortion due to use of wide-angle lens in camera.**

PANHARD CAR WITH LABOURDETTE LIMOUSINE BODY SHOWN AT PARIS SALON.

Driver's seat entirely enclosed, with entrance through door on left side as shown, the right side being permanently closed. The door is hinged to swing forward. The doors giving entrance to the rear portion open toward the rear. Steering wheel is under the curve of the high dash, and the window above is hinged to swing up against the roof. Wide angle lens of camera causes bad distortion, especially noticeable at front end of car.

ment is required to use the brakes in the most effective and least harmful way.

### Compressed-Air Brake.

The difficulty of obtaining sufficient experience and skill to manipulate brakes in the most advantageous way is responsible to a great extent for the fact that inventors and manufacturers of automobiles are constantly on the lookout for better brakes. An interesting effort in this direction was shown at the 1904-5 Paris show and consisted of the application of compressed air to the operation of the brakes. Though crude and lacking in refinement of detail, this brake possessed many advantages over the ordinary type. [This had previously been successfully applied in an American car.—Editor.]

The ordinary brake is a source of constant fatigue to the driver, especially in heavy traffic; and, moreover, it diverts his attention from the steering of the car and the handling of his gears. Again, it is too slow for the best effect, because the necessary leverage is obtained only by lengthening the stroke of the lever and consequently the time required to set the brake. The little valve handle required to operate the air brake makes it possible to apply the brakes with much celerity. There is, however, a fault with the air brake; it almost invariably locks the wheels. It would seem that when fully developed, this brake will have a great future for automobile work.

The use of shoe brakes acting directly on the tires was soon abandoned because of the destructive effect on the tires and because the friction between the shoe and a wet tire was very slight, quite insufficient for the purpose. It was found necessary to adopt the expedient of using a separate drum, attached to the hub, to the driving sprocket where drive is by side chains, or to some other rotating part, such as the differential shell, the driving shaft or the transmission shaft.

### Equalizing Braking Effort.

With hub brakes it is very important that the braking effect should be the same on both wheels, as unequal braking lessens the effectiveness of the brakes and tends to cause skidding. It is, therefore, good practice to use some form of equalizer. Most commonly this consists of a beam to the center of which the brake lever is connected, the brakes being connected to the two ends of the beam. This apparatus, however, is very limited in its capacity for equalizing friction.

A brake gear used on the old Mercedes cars had the same drawbacks. In this arrangement the hand lever rocked a hollow cross shaft, at each end of which was a grooved arm. A cable passed through the hollow shaft and over the grooved ends of the arms, and the cable ends were secured to the brakes. When the driver pushed his lever the cable was pulled tight by the arms and any inequality of tension was equalized by the slipping of the cable through the shaft and over the arms.

### Lemoine Braking System.

Another arrangement was that of Lemoine; this consisted of an arrangement exactly similar to a bevel gear differential, except that it only moved through a small part of a revolution. The bevel pinion was adapted to be moved in an arc with the shaft of the large gears as a center, by the brake lever; the large bevels, however, in this case consisted of sectors only, the sides opposite to the pinion being formed into levers to which the brake rods were attached. The action was precisely similar to that of the bevel gear differential.

Another early brake consisted of a rope coiled around a drum, blocks of wood being interposed between the drum and the rope to prevent the rapid wearing of the latter.

A form of brake that was much used in earlier days, and is still in use on small and inexpensive cars, consisted of a spring steel band with a lining of some friction producing and wear resisting material. One of the ends is attached to a fixed point, the other being connected with the brake lever. The natural spring of the steel keeps it clear of the drum when not held on by the lever.

A serious defect possessed by most of the old brakes was that they would not hold the car, if it started to run backwards, as, for instance, down a steep grade if the motor stalled. An arrangement adopted by a number of makers, including some in England, was to use two bands on the same drum, starting from a common fixed point, but

STAND OF AN AMERICAN EXHIBITOR AT THE GREAT PARIS SHOW.

wound around the drums in opposite directions; both bands were operated by the same movement of the lever. This construction was expensive, however, and gave no better results than the simpler and no more expensive forms devised later on.

### Internal and External Types.

Two-piece brakes came later, and were of two general types, internal and external. The external type was the earliest, but is found on the smallest number of modern European cars. The two parts, generally steel or iron castings, are sometimes in direct contact with the drum, and sometimes lined with other material. A cheap and easily renewable metal lining was much favored; brass, bronze, copper, steel and castiron all had their advantages. Soft, anti-friction metal was tried, but proved to be unequal to the heat generated by prolonged braking and would melt and run out.

Many different methods of operating these brakes were devised, but the best was an eccentric arrangement, which was quick and certain in action and was, to a certain extent, self adjusting for wear. A toggle system was also extensively used, and had many good points. A device which was powerful but slow in action consisted of a short rod with a right-hand thread on one end and a left-hand thread on the other. The threads were screwed on to suitable lugs in opposite halves of the brake; rotating, the rod caused the brakes to close or open, according to the direction of rotation.

Brakes of the internal expanding type are now more commonly used in European cars than any other one type, though they are not altogether free from defects. One drawback is the liability to overheat, owing to the lack of free air circulation. In the brake used by the manufacturers of the Clement cars, and which will be used in the 1906 C. G. V. cars, the two parts of the internal brake are kept together and out of contact with the drum by a stiff spring. A pair of levers, pivoted at their centers, serves to press the halves apart and against the drum. The French firm of Peugeot uses an internal brake on the transmission, and special means are adopted to prevent overheating. The brake is enclosed in an oil-tight casing and runs continually in a bath of oil. This gives excellent results, and has been adopted as the standard for the Peugeot car.

### Chenard-Walcker Brake.

The Chenard-Walcker clutch brake has been in use for many years. This system consists in using the clutch cone as a brake. The clutch is of the ordinary cone type, engaged by being pushed into a recess in the flywheel. The cone is double, however; when the movement of withdrawing the clutch is continued after the clutch is free, the cone on the back of the disc enters an internal fixed cone, and great friction is set up. The disadvantages of this arrangement are that the brake cannot be used until the clutch is disengaged; and it is useless if any of the connections between it and the rear wheels are broken or if the gears are in the neutral position.

The French Raissinier brake acts on the interior and the exterior of the drum at the same time, and has given remarkable results in tests. Two rollers are mounted on a lever in such a way that when a brake is in the off position the drum passes between the rollers. By swinging the lever the rollers are made to bear against the drum, on opposite surfaces, and a powerful braking action is the result. In an official test a car, fitted with this brake, carrying five passengers, was brought to a stop in thirty feet from a speed of thirty miles an hour. All the parts are thoroughly lubricated, and the brake seems to be, in many ways, almost an ideal one.

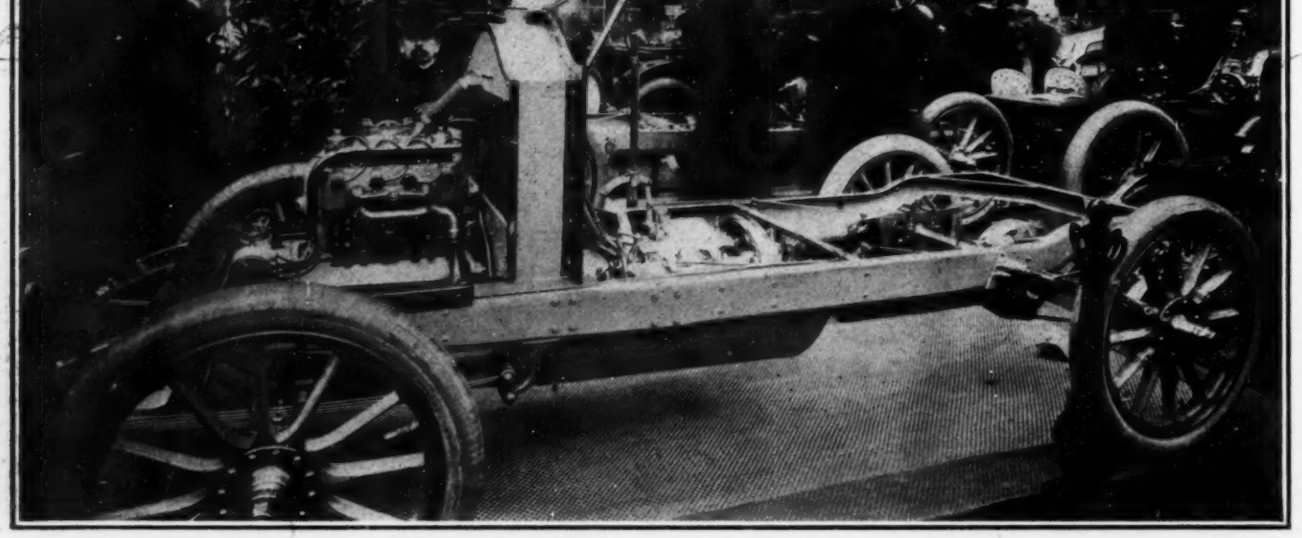
## "Get a Horse."

According to the New York *Sun*, the expression "Get a horse" may have had its origin in Ireland, and if so, the original automobile must have been no automobile at all, but a flying machine, either that or it had amphibious habits. Anyhow, as Bobby Gaylor used to preface his stage remarks, this is the discussion as printed in the "Questions and Answers" department of the Sunday *Sun*:

The nurse corrected my children for shouting "Get a horse" at a passing automobile. The correction I approve on the score of manners, but its method has puzzled me. She said: "'Twas saying that same that took Manny Malone from Arrow Hill and set him down in Spain." When asked to explain, the girl said it was a foolish thing and she didn't remember the rights of it. Who was Manny Malone and how did he come to imitate Lord Bateman?

C. H. Lane.

"It seems to be, with some small inaccuracies of names, a story that Thackeray, in Chapter 16 of "The Irish Sketch Book," recites as contained in "Hibernian Tales," which he identifies solely as one of "two little yellow volumes purchased at Ennis." This is his quotation: "In the parish of Ahoghill lived Manus O'Malaghan. As he was searching for a calf that had strayed he heard many people talking. Drawing near, he distinctly heard them repeating, one after the other, 'Get me a horse, get me a horse'; and 'Get me a horse, too,' says Manus. Manus was instantly mounted on a steed, surrounded with a vast crowd, who galloped off, taking poor Manus with them. In a short time they suddenly stopped in a large, wide street, asking Manus if he knew where he was. 'Faith,' says he, 'I do not.' 'You are in Spain,' said they." A pleasing tale of the little folk.



RENAULT 10-HORSEPOWER TOWN CARRIAGE CHASSIS, AT PARIS SALON WITH FOUR-CYLINDER MOTOR IN ONE CASTING.

# Locomobile Features of Construction.

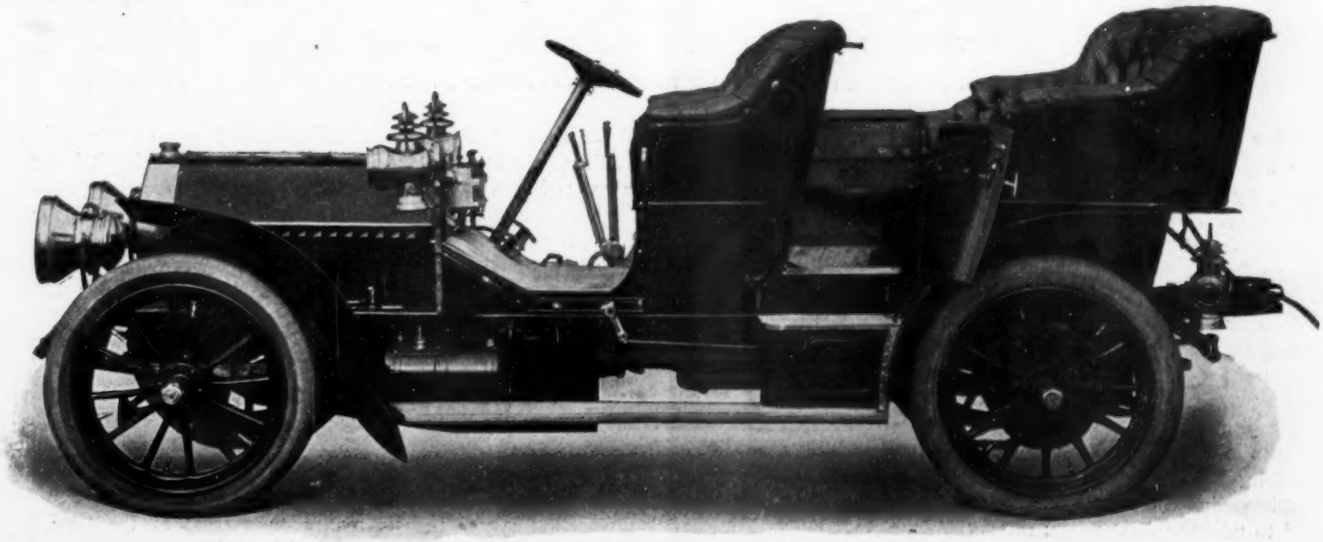
IN designing the two models that will be placed on the market for the season of 1906 by the Locomobile Company of America, of Bridgeport, Conn., the lines followed in former Locomobile models have been closely adhered to and what changes have been made are in the matter of detail; the manufacturers state that the main features of the car remain practically as they were in the first gasoline cars built by this concern. to tell one machine from the other at first glance, but on looking closer it will be seen that the smaller car, Type E, has a concave dash, the larger machine having a flat dash; the tonneau of the larger car is also longer in proportion than the other. Bodies are of the straight-line type, built up of bent wood with roomy and comfortably upholstered seats, the front seats being of the popular divided type; running-boards extend from front to rear fenders, and the chain guards form steps to the tonneau. The footboard has the upward slope that is usually seen on touring cars; the hood is of the Mercedes form, of aluminum, with ventilated sides.

LOCOMOBILE 15-20 HORSEPOWER TYPE E TOURING CAR FOR 1906. WITH CONCAVE DASH AND STRAIGHT-LINE BODY.

The new models will both be side-entrance touring cars of the conventional type, side-chain driven, with four-cylinder vertical water-cooled motors. Type E will have a motor of 15-20 horsepower, while Type H will have a motor of 30-35 horsepower. With the exception of the difference in dimensions and a few details, the two cars are mechanically identical. In outside appearance there is an absence of marked distinguishing features that makes it difficult

With regard to mechanical features, the general specifications of the two models are identical. The four-cylinder vertical water-cooled motor is bolted by the crankcase arms direct to the main frames, no sub-frames being used. Ignition is by mechanical make and break, low-tension current being generated by a gear-driven magneto built by the Locomobile Co., and the time of ignition is varied by shifting the ignition cams so as to bring different parts of the varied-profile cams under the tappet rods. The motor speed is controlled by hand through a governor working on the throttle. Power is transmitted to the transmission gears by a leather-faced cone clutch; the sliding gears give three speeds forward and one reverse, operated by a single lever, with direct drive on the high gear. Differential and bevel gears for driving the jackshaft are enclosed in the rear end of the transmission gearcase; the rear wheels are driven by side chains, the sprockets being bolted to the spokes of the rear wheels.

The motor has its cylinders cast in pairs; heads, water jackets and valve housings are integrally formed, and the cylinders are bolted to the crankcase by flanges in the customary way. The valves are mechanically operated and are placed on opposite

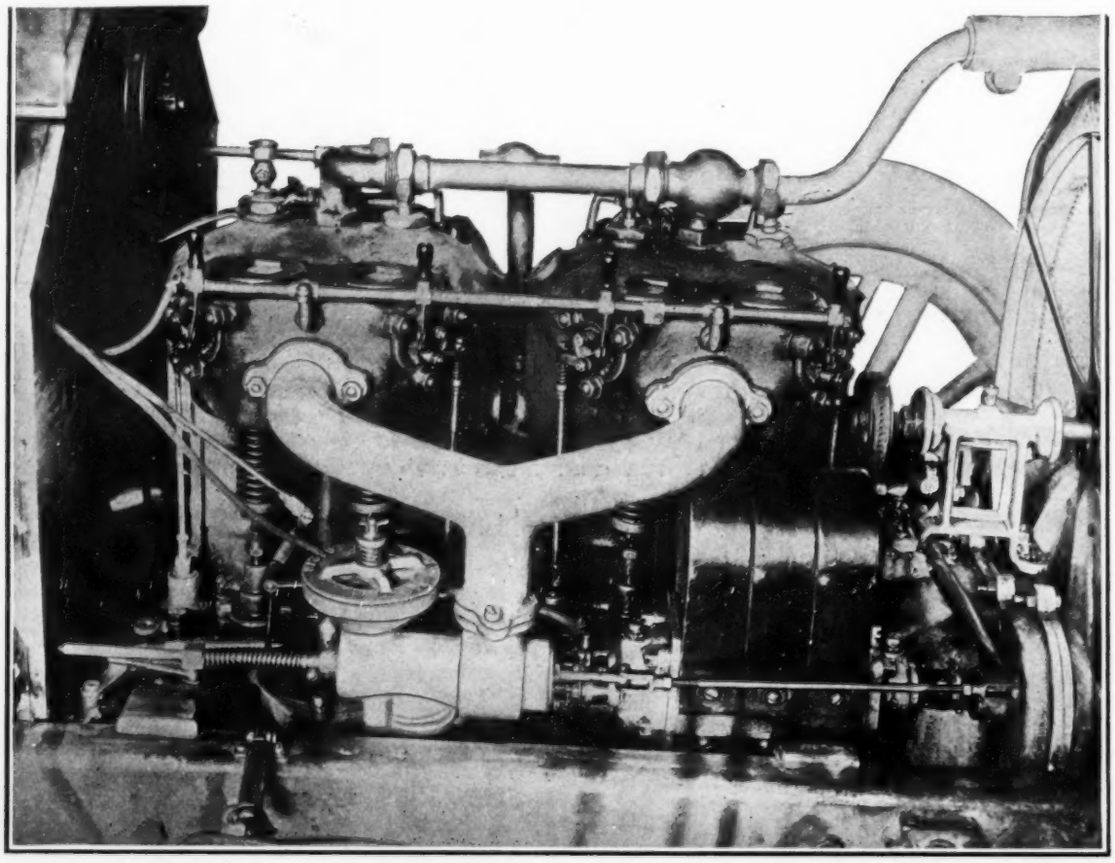


LOCOMOBILE 30-35 HORSEPOWER TYPE H TOURING CAR, WITH LONG WHEELBASE AND STRAIGHT DASH. —NOTE LUGGAGE RACK AT REAR.

sides of the cylinders, the inlet valves on the right and the exhaust valves on the left; valves are all alike and interchangeable, and each is made from a single steel forging. The lower end of the valve-stem is plain; the upper end of the push-rod is equipped with an adjusting arrangement consisting of a cap-nut held in place by a jam-nut below it; by screwing the cap-nut up or down, the effective length of the rod may be varied, the jam-nut holding the adjustment when obtained. The valve springs are held in compression by concave washers kept in place by keys passing through the stems. Removing a valve spring is made easy by the use of a special forked tool which is passed over the valve stem below the prevent the rod from turning and bringing the axis of the roller out of parallel with the axis of the camshaft. The squared part is of ample size to give good wearing qualities and, together with the roller, pin and other parts of the rod, is hardened and ground. The push-rod guide enters a counterbore in the top of the crankcase for a short distance and screws passing through flanges hold it in position.

Each camshaft, with all its cams, is made of a single steel forging and is hardened and ground all over. The camshafts are interesting pieces of work, especially the inlet camshaft, which carries the ignition cams in addition to the inlet valve cams. The valve cams are, of course, sufficiently long so that dinal motion without lateral play; the movement of this shaft from extreme advance to extreme retardation of spark is three-quarters of an inch. The camshafts run in bronze bearings and are lubricated from the crankcase.

The ignition system has been worked out with a view to obtaining the greatest possible freedom from electrical troubles; there is no wiring about the body of the car—in fact, the only wiring is the connection between the magneto and the bus-bar on the engine, which is in an accessible position and not liable to damage. The fact that there is no high-tension current to insulate is a point in favor of the low-tension system. The bus-bar is connected to each of



INLET SIDE OF LOCOMOBILE ENGINE, SHOWING CARBURETER, MAGNETO AND MAKE-AND-BREAK SPARK MECHANISM.

washer and its ends rested on a lug cast for the purpose on the adjacent cylinder wall; by raising the fork the washer and spring are raised and the key can be removed from the valve-stem, leaving the spring free to drop and the valve-stem free to pass upward through the guide. The valves are removed through openings directly over them, closed by screw plugs; the joints of the plugs are made tight by gaskets of copper and asbestos. In the top of each valve head is a central boss with a slot cut in it to take the screw-driver or special tool used in grinding in the valves. The push-rod has a hardened steel roller on its lower end to take the cam thrust; the part of the rod that slides in the guide is squared to the push-rod rollers will not drop off when the shaft is moved longitudinally in varying the time of ignition; the apex of each valve cam is parallel with the axis of the shaft, so that the timing of the valve is not changed with the movement of the shaft. The ignition cams, however, being made with a view to varying the time of ignition, have their apexes disposed at an angle with the axis of the shaft, like the thread of a screw of very steep pitch. A collar for the fork, by which the shaft is moved, is also an integral part of the shaft. The front or gear end of the camshaft is squared and passes through a square hole in a sleeve on which the gear is mounted. The shaft is a close but easy sliding fit in the sleeve so as to allow longitu- the insulated electrodes of the igniters by knife-blade switches, the circuit being completed through the body of the magneto and the metal of the engine, to which the magneto is grounded.

The magneto is secured to the right-hand front arm of the crankcase by a single heavy bolt, steel dowel pins preventing swivelling and at the same time permitting the removal of the magneto with the minimum of trouble. The magneto is driven from the gear on the inlet camshaft through a simple little coupling which makes it impossible to couple up the machine wrongly—a matter of importance, as the magneto is set to deliver its maximum current at the time of advanced ignition. The coupling consists of

PARTS OF LOCOMOBILE VALVE SEPARATED, SHOWING PUSH-ROD AND GUIDE, SPRING AND STEM WITH MUSHROOM.

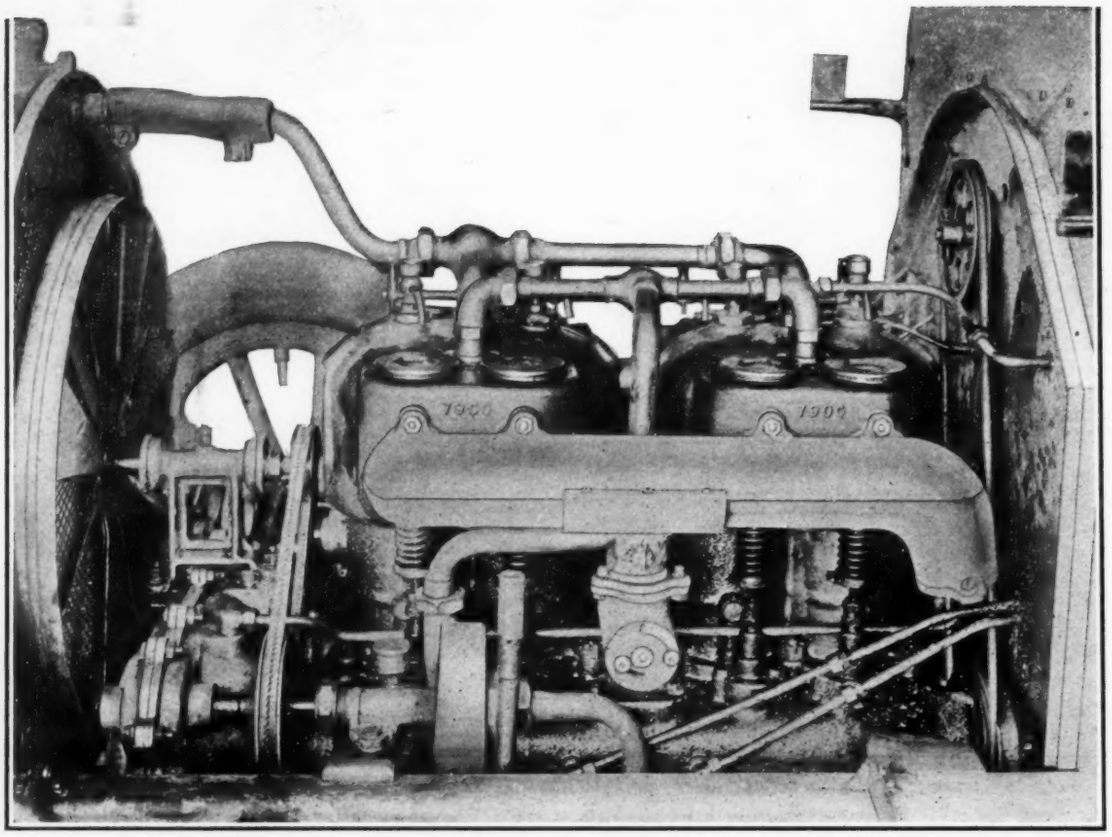
PARTS OF LOCOMOBILE MAKE-AND-BREAK SPARK MECHANISM SHOWING PLATES WITH HAMMER AND ANVIL AND PUSH RODS.

two plates, one on the gear shaft and the other secured by its hub to the shaft of the magneto armature; in the illustration showing the parts of the magneto the coupling may be seen, one-half attached to the end of the shaft of the separate armature shown, and the other half lying close to it. Each plate has a pin in one end and a slot in the other; in coupling up, the pin in one plate is entered in the slot in the other; and there is no other way of putting the parts together. The H-armature has heavy bronze ends secured to it by screws which are sweated in. The short sections of shaft on which the armature is supported are screwed tightly into the end pieces, the ends riveted over on the inside and, as a final precaution, a "dutchman"—a pin driven into a hole drilled lengthwise half in the shaft and half in the end piece—is inserted. The journals are supported in bronze bearings and are provided with rings close to the armature; these rings revolve with the shaft and throw off any oil that might work past the bearings. Oil is thus kept off the armature, and a serious difficulty sometimes experienced with mechanical generators is, according to the manufacturers, avoided entirely, practical road tests having shown that the oil does not reach the armature. The excess oil runs off through vent holes. Aluminum castings screwed to the body of the magneto support the bronze bearings. The inner end of the armature winding is grounded in the metal of the armature core; the outer end is attached to a steel pin which passes through a hole drilled through the center of the shaft; the pin is insulated from the shaft, and the current passing through it is taken up by a brush, made of flat steel bent upon itself and pressing against the pin; from the brush, which is insulated, the current is led to the bus-bar by a wire. This spring brush is clearly shown at the extreme left-hand end of the shaft of the complete magneto. For the ground connection another brush is fitted, as the contact between the shaft and its bearing is electrically imperfect owing to the oil used for lubrication. The ground brush is a small rod of carbon pressed against the shaft by a light helical spring. The manufacturers state that during the prolonged and severe tests to which the first 1906 cars were subjected the magneto gave no trouble whatever, and even at the conclusion of the testing period required no attention.

The make and brake electrodes are carried by a plate having a tapered face like a poppet-valve, which fits a corresponding seat in the side of the inlet valve chamber, the surface being ground to a gas-tight fit; three screws hold the igniter plate in position. The stationary electrode in the cylinder is insulated and carries, outside the cylinder, the contact pieces for the knife-blade switch; the inner end carries an iridium contact point. The movable

LOCOMOBILE CAMSHAFT WITH INTEGRAL CAMS, FORGED IN ONE PIECE, HARDENED AND GROUND.

LOCOMOBILE MAGNETO ASSEMBLED AND SEPARATED TO SHOW H ARMATURE IN POSITION IN HORSESHOE MAGNET, AND DRIVING CONNECTIONS



EXHAUST SIDE OF LOCOMOBILE ENGINE, SHOWING PUMP AND FAN WITH BELT DRIVE AND BELT TO LUBRICATOR.

electrode, which is not insulated and is therefore in electrical connection with the magneto through ground, has an iridium-tipped arm or hammer inside the cylinder making and breaking contact with the stationary electrode or anvil, while outside the cylinder it is rigidly secured to another arm to which motion is imparted by the tappet rod. The contacts are brought together by the rising of the tappet rod on its cam an instant before the spark is required; at the proper time the the cam allows the rod to drop suddenly, with the result that the contacts inside the cylinder are suddenly separated and a short, hot arc is formed.

Pistons are made slightly tapering, the head or closed end being slightly smaller than the open end to allow for unequal expansion when the motor is at work. The piston on the 15-20-horsepower motor is 3 3-4 inches in diameter, has a stroke of 4 1-2 inches and is 5 1-2 inches long; the 30-35-horsepower motor has pistons 4 1-2 inches in diameter with a stroke of 5 1-2 inches, and the pistons are 8 1-2 inches long. Being light, the pistons are cast with interior webs for the sake of strength. The four rings on each piston are turned eccentric and are split diagonally; oil grooves are cut in the lower part of the piston. The piston pin is of hollow steel and is effectually prevented from protruding and scoring the cylinder walls by screws passing through the boss in the cylinder and the wall of the pin. In the ends of the screws are holes; a single wire passes through both holes inside the pin and the ends are bent over, making a safe locking arrangement.

Connecting rods are of I-section with bronze bushings at each end; the piston pin bushing is solid, while the crank-pin end is split marine fashion and is fitted with a series of copper shims between the brasses. These shims are of different thicknesses so that nice adjustments for wear can be made by removing a shim of the proper thickness and bolting up the brasses again. Two steel bolts hold the cap on the end of the connecting rod.

Crankshafts, like all other forgings, are made in the forging shop of the Locomobile plant; they are of a special steel and are given a toughening treatment after forging. The shaft runs in three bronze bearings. The flywheel is bolted to a flange forged integral with the shaft, steel fited bolts being employed. The bearing surfaces of the crankshaft are hardened and ground.

The crankcase is split horizontally; the upper half is cast of manganese bronze, which gives ample strength to withstand the stresses imposed by the work of carrying the cylinders and the crankshaft. The lower half is of aluminum, having no more severe work than carrying lubricating oil and keeping out dust and dirt. The supporting arms are cast integral with the upper half of the crankcase and are of deep box section, open side downward. All the gearing for driving the camshafts, magneto and circulating pump is enclosed in an aluminum casing at the front of the engine and all can be exposed by the removal of a cover which protects all the gears.

Circulation of the cooling water is maintained by a centrifugal pump bolted to the left-hand front arm of the engine and driven by a pinion meshing with the large gear on the exhaust camshaft. A cellular cooler is placed in a cradle or dropped crosspiece, and is not attached to the side frames. To this fact the manufacturers attribute much of the freedom of their radiator from leakage, as it is not twisted by the springing of the frames on rough roads. A large aluminum fan with a stiffening ring at its circumference is mounted on a spindle running in ball bearings in a bracket bolted to the top of the casing which covers the gearing at the front of the engine. The fan is driven by belt from a pulley mounted on the pump-shaft between the pump and its driving gear. The tension of the fan belt can be adjusted by shifting the bracket, slots for the holding-down bolts being provided for the purpose. A small circulation indicator on the dashboard keeps the driver informed as to the work his pump is doing.

The float feed carbureter is fitted with an aluminum auxiliary air inlet and has a balanced throttle of the piston type, operated by a centrifugal governor; the ordinary air inlet is sufficient for speeds up to about 15 miles an hour on the high gear, after which the auxiliary air valve opens. The auxiliary air is taken in cold, while the regular air supply may be taken in hot from a hood surrounding the exhaust manifold or may

be taken in cold, according to temperature and atmospheric conditions. Priming may be done from the seat by means of a handle on the dash.

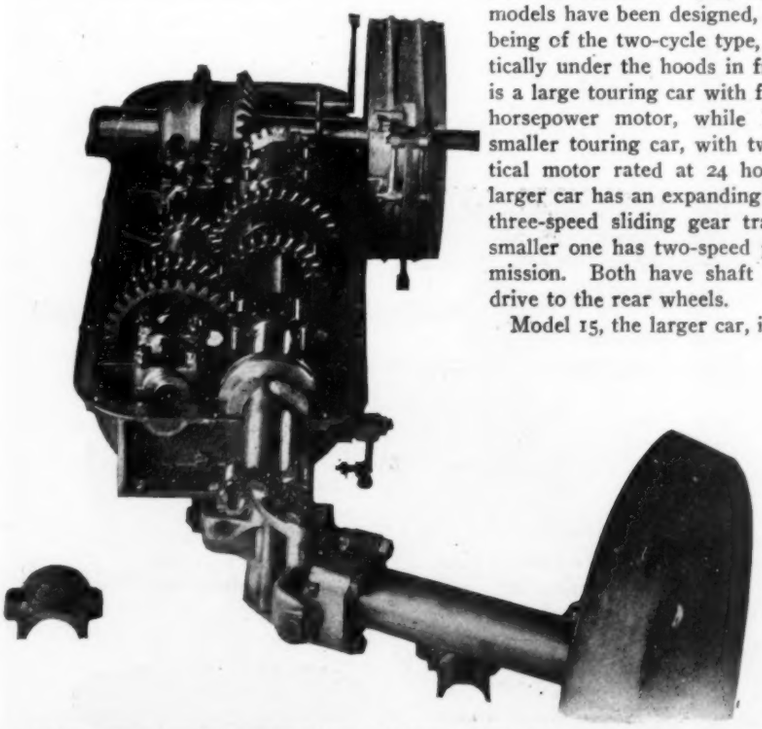
A lubricating oil pump placed on the dashboard is belt-driven from the rear end of the exhaust camshaft. Three leads carry oil to the compartments of the crankcase and to the gear casing at the front of the motor. The lubrication of the pistons and rod bearings is accomplished by splash. A standpipe projects upward into each crankcase compartment, so that when the oil is too high it overflows and can be let out through drip cocks placed under the crankcase and operated from the dashboard. A hand oil pump is fitted for emergency use.

The clutch is of the leather-faced cone type, and has flat springs behind the leather to prevent sudden and "fierce" gripping. Between the clutch and the transmission gear is a double universal joint. The clutch is held in engagement by two helical springs carried on studs on each side of the shaft. The springs can be quickly adjusted and can easily be removed if necessary. Thrust is taken by ball bearings, and the usual pedal controls the clutch. The transmission gears are enclosed in a case made of three parts; the main or central part, which carries the bearings and is subjected to practically all the stresses, is of manganese bronze, while the top and bottom sections are of aluminum. The case encloses the bevel driving gears at the rear end. A single sliding set controlled by a single lever gives all three speeds and reverse. The gear shafts run in plain phosphor bronze bearings lubricated by oil from the gearcase, pockets being provided to catch the lubricant. All the gears are of special steel, hardened. The differential is of the bevel gear type and its casing is of forged steel. The left-hand differential sleeve extends beyond the casing and carries the drum for the differential brake. Each half of the jackshaft is fitted with a compensating joint to allow for frame springing. The outer ends of the jackshaft run in bronze bearings; the sprockets are of hardened steel.

The frame is of pressed steel with four pressed steel cross members and is hot riveted together; the two middle cross members are used as supports for the transmission gearcase. Forged steel spring horns are hot riveted to the ends of the side frames. Springs are all semi-elliptic and have bronze bushed eyes and fitted steel bolts. Front and rear axles are of I-beam section, each forged in two pieces and hand welded in the center; the front axle is dropped at the center and with it are forged the steering heads; all wheel bearings are plain bronze bushings with grease reservoirs to ensure adequate lubrication.

Besides the band and drum brake on the differential there is an emergency brake, consisting of expanding rings in cast steel drums on the hubs of the rear wheels. The emergency brake is connected to the hand lever by steel cables, a compensating arrangement equalizing the pull on each side. Steering gear consists of an inclosed worm and sector.

The 15-20-horsepower car has a wheelbase of 93 inches, 32-inch wheels with 4-inch tires, rear springs 44 inches long and front springs 36 inches long. The 30-35-horsepower car has a wheelbase of 106 inches, 34-inch wheels with 4 1-2-inch tires, rear springs 44 inches long and front springs 40 inches long. In both models an aluminum pan is placed under the engine and gearcase. Running-boards are covered with rubber and are supported by forged steel brackets attached to the main frames; mud-guards are wide, and are of aluminum, as is also the hood, which is hinged at the top. Under the body at the rear is a compartment with a large drawer divided into separate compartments with places for tools on one side and places for oil and grease cans on the other. The color of the paintwork is optional, as is also the upholstering. Plain leather, however, is recommended by the manufacturers for the seats, owing to its greater durability and cleanliness. The equipment of each car consists of five lamps, irons for top, a tire carrier and a tool box containing a set of tools and extra parts for the car.



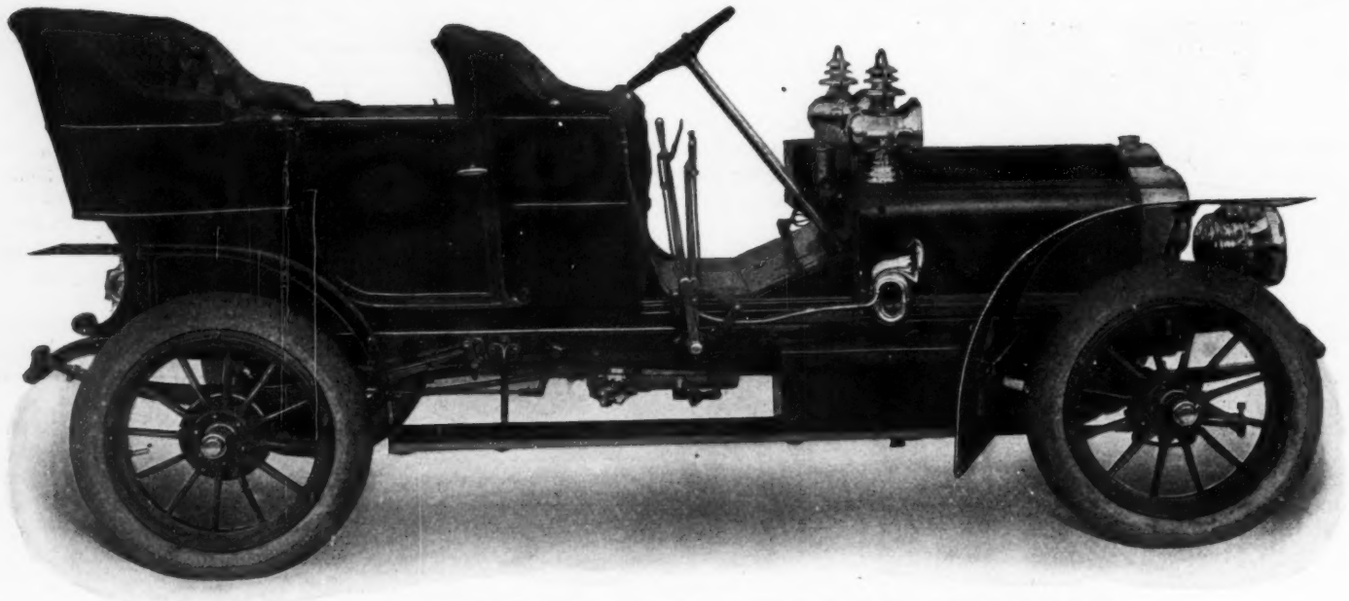
LOCOMOBILE TRANSMISSION AND CLUTCH CONE, ILLUSTRATING DOUBLE UNIVERSAL JOINT IN SHAFT.

# Elmore Two-cycle Vertical-engine Cars.

AUTOMOBILES fitted with two-cycle motors have for years been built by the Elmore Mfg. Co., of Clyde, O., a firm which has devoted itself exclusively to this type of motor. Heretofore the Elmore motors, with single and double cylinders, have been hung under the bodies of the cars. For the season of 1906, however, two new models have been designed, the motors still being of the two-cycle type, but placed vertically under the hoods in front. Model 15 is a large touring car with four-cylinder 35-horsepower motor, while Model 14 is a smaller touring car, with two-cylinder vertical motor rated at 24 horsepower. The larger car has an expanding ring clutch and three-speed sliding gear transmission; the smaller one has two-speed planetary transmission. Both have shaft and bevel gear drive to the rear wheels.

Model 15, the larger car, is a typical large touring car with side-entrance body, providing plenty of space for the passengers, a wheelbase long enough to give easy riding, in combination with long springs, and a general outline that is at once simple and attractive. Probably the most noticeable feature of the engine is its clear, unencumbered appearance; there are no valves on or connected with the engine, and consequently there is no necessity for gears, camshafts and other moving parts for operating valves. The only gears used about the engine are the bronze bevels, of equal size, which rotate the timer at the same speed as the crankshaft.

The motor operates on the three-port system; this system has already been described at length in THE AUTOMOBILE, but it may be said that two ports in the cylinder wall, alternately covered and uncovered by the piston, carry the combustible gases into and the exhaust out of the cylinder; a third port in the cylinder wall, placed low down so as to open into the crankcase when the cylinder is at its highest point, allows the mixture from the carbureter to pass into the crankcase, where it is compressed and later forced through a connecting passage and the inlet port into the cylinder. An impulse is imparted to the crankshaft once every revolution by each cylinder; thus four cylinders give an impulse to the crankshaft every quarter of a revolution, the same as two double-acting steam cylinders, and the same as an eight-cylinder four-cycle explosion motor. This results in smooth running and a steady pull which is of special advantage on hills.



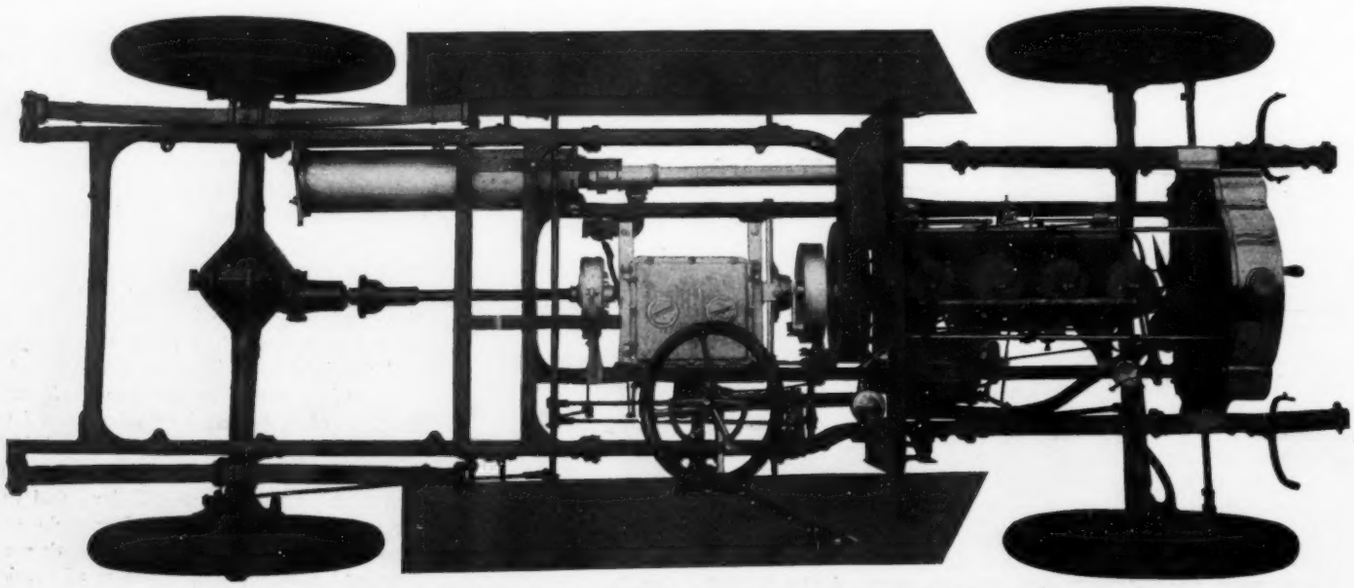
NEW ELMORE 35-HORSEPOWER, FOUR-CYLINDER, TWO-CYCLE MOTOR-IN-FRONT TOURING CAR

The cylinders of the four-cylinder Elmore have a bore of 4 1-2 inches and a stroke of 4 inches; the heads are dome-shaped inside and are cast integral with the cylinders, as are also the water jackets. The pistons are fitted with four rings each, one ring being near the bottom; crankshaft is made from a steel forging and has large bearings. Cylinders, pistons and all bearing surfaces are ground. Water piping and other engine fittings are of cast brass. The pump is positive and is rotated by the timer shaft. Lubrication of the motor is accomplished by a Hill precision oiler, and sufficient oil for 300 miles' running, is carried. The carbureter, made at the Elmore factory, is of the Krebs type and, the manufacturers state, will use any grade of gasoline.

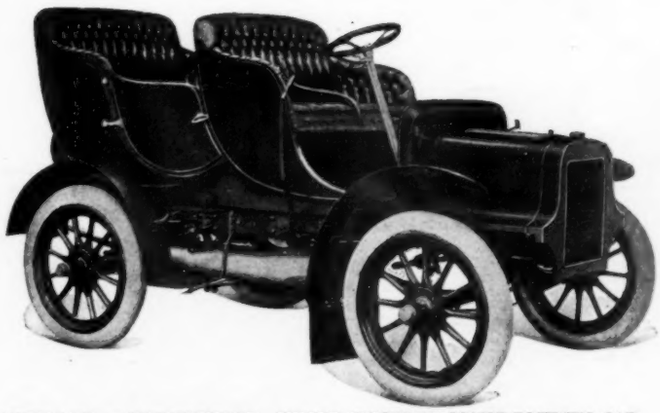
Throttle and ignition levers are placed in the usual position above the steering wheel, but do not turn with the wheel; the throttle is also connected with the clutch pedal, so that when the clutch is withdrawn the engine is automatically slowed down. A pedal and a side lever control the service brake on the driving shaft and the emergency brakes on the hubs of the rear wheels respectively. The three speeds and reverse of the sliding gear transmission are controlled by a single lever, and an interlocking system prevents the engagement of the clutch when the gears are not fully meshed.

The clutch is an expanding bronze ring and is said to be smooth in action and to require adjustment only at long intervals; it is self-centering, so that it is always well clear of the drum when disengaged. The clutch is placed a few inches behind the flywheel and is a separate unit, the flywheel not being used as one member of the clutch as when the cone type is employed. The transmission shafts run on roller bearings; a universal joint is interposed between the clutch and the transmission gearcase. The transmission gearcase and the engine are bolted through laterally extending arms to a sub-frame. The propeller shaft terminates at each end in a universal joint, one directly in the rear of the transmission gearcase and the other just in front of the bevel gear casing on the rear axle. The thrust of the bevel driving gears is taken on ball bearings, and the rear wheels run on Hyatt roller bearings. Spur differential gearing, of Brown-Lipe manufacture, is fitted and, with the bevel driving gears, is enclosed in a casing with removable top. The front axle is tubular and the front wheels run on large ball bearings.

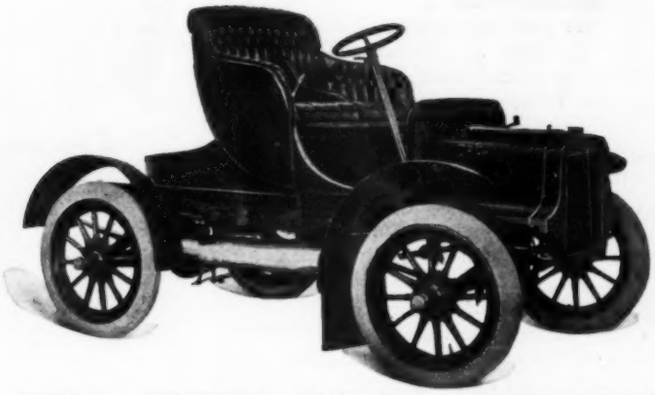
The framing is of pressed steel, well braced and stiffened by heavy gusset plates at the corners, and is narrowed at the front. Special attention is given by the manufac-



ELMORE CHASSIS PHOTOGRAPHED FROM ABOVE SHOWING TRANSMISSION SYSTEM AND SHAFT DRIVE.



CADILLAC 10-HORSEPOWER, SINGLE-CYLINDER LIGHT TOURING CAR.



CADILLAC 10-HORSEPOWER CHASSIS, WITH RUNABOUT BODY AND TURTLE BACK.

turers to the matter of springs. These are all semi-elliptic and two inches wide; the rear springs are 48 inches long and have five leaves, while the front springs are six inches shorter, with the same number of leaves. The manufacturers state that there are five special grades of steel in each spring and that each leaf is graduated in thickness. The leaves are polished all over to avoid internal friction, and clips are fitted to prevent breakage from violent recoils.

The radiator is of the flat tube type, the tubes having radiating fins attached; the tank is combined with the radiator, and the car will run about 150 miles on one filling of water. A twenty-gallon gasoline tank is placed under the seat and connected with the carbureter by a removable copper tube. A metal pan under the engine and transmission gearcase protects those parts from dust, mud and water. The wheelbase of the car is 104 inches and the tread standard. Wheels are 34 inches in diameter, with 4-inch tires of optional domestic manufacture.

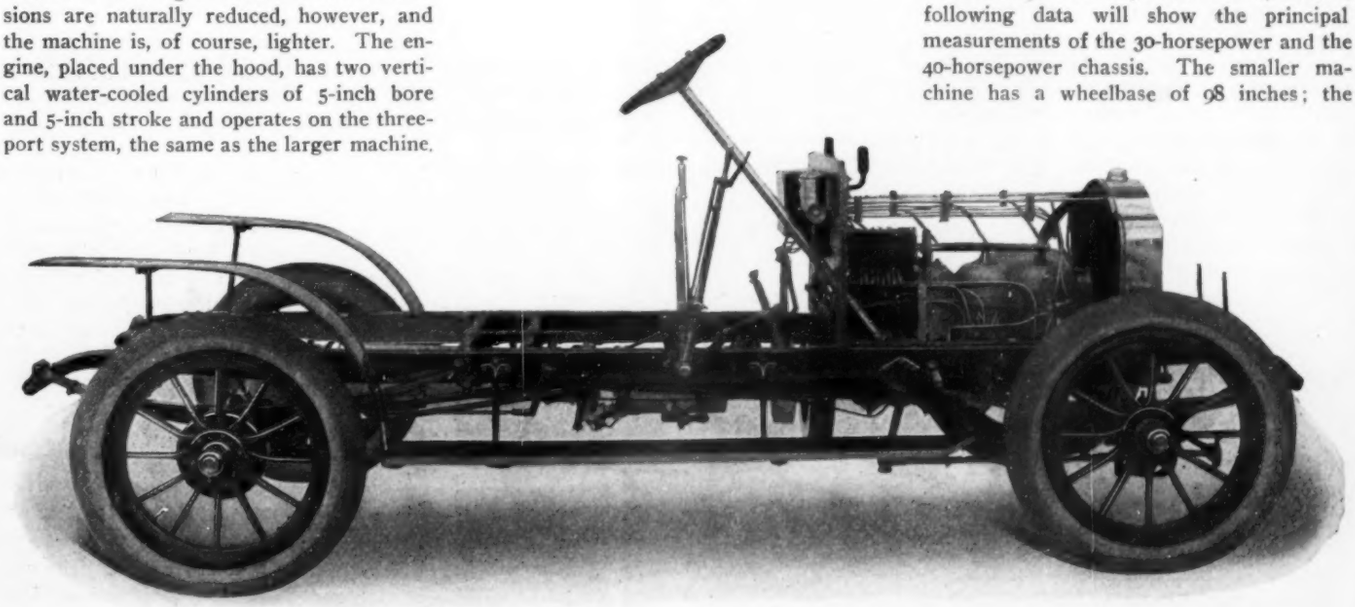
In general design and construction Model 14, the 24-horsepower two-cylinder car, is similar to the larger machine. The dimensions are naturally reduced, however, and the machine is, of course, lighter. The engine, placed under the hood, has two vertical water-cooled cylinders of 5-inch bore and 5-inch stroke and operates on the three-port system, the same as the larger machine. A planetry transmission takes the place of sliding gears, and gives two forward speeds and reverse, with single lever control. A clutch of the same type as that on the larger car is fitted, and is controlled by the same lever that controls the speed gears. The wheelbase is 92 inches and the tread is standard. The body is of the touring type, with side entrances; the tonneau may be removed and a sloping deck or "turtle-back" substituted.

## Cadillac Line for 1906.

For the season of 1906 an extensive line of cars will be placed on the market by the Cadillac Motor Car Co., of Detroit, Mich.; no less than ten models wil be included in the list. Five of these will be equipped with the well-known Cadillac single-cylinder 10-horsepower horizontal motor, viz.; two-passenger runabout, small touring car, light delivery wagon, folding tonneau car and coupé. The remaining five will consist of four-cylinder cars of the conventional touring type. Model H will be a 30-horsepower car with accommodation for five passengers; the same chassis will be fitted with a runabout body and with a coupé. Model L will be a 40-horsepower touring car, while the 40-horsepower chassis will also be fitted with a limousine body. The same chassis is used in a number of models, the difference being in the style of body only.

Both the four-cylinder chassis have shaft and bevel gear drive and the special planetary transmission designed by the Cadillac company for these large machines; the transmission differs from the majority of planetary gears in giving three forward speeds. Hess-Bright ball bearings of the non-adjustable type are used freely, being fitted to the rear axle, the road wheels both front and rear, the transmission, and even the engine. Drums on the rear hubs carry both internal expanding and external contracting brakes. The speed of the engine is controlled through a governor. Lubrication is effected by a pump lubricator of Cadillac design, the quantity of oil fed to the bearings being proportioned to the speed of the engine. Ignition is by jump spark.

The cars, of course, differ in size, and the following data will show the principal measurements of the 30-horsepower and the 40-horsepower chassis. The smaller machine has a wheelbase of 98 inches; the



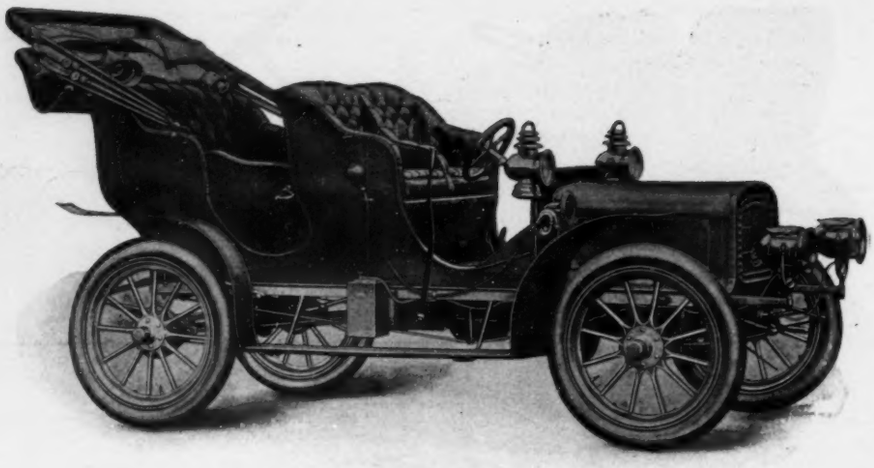
SIDE VIEW OF CHASSIS OF ELMORE 35-HORSEPOWER CAR, SHOWING LOW POSITION OF FOUR-CYLINDER ENGINE

four-cylinder motor has cylinders of 4 3-8-inch bore and 5-inch stroke. Road wheels are 32 inches in diameter and all four wheels are fitted with 4-inch tires. With touring body, the car weighs 2,400 pounds.

The 40-horsepower four-cylinder car has a wheelbase of 110 inches; the motor has cylinders of 5-inch bore and 5-inch stroke. The road wheels are large, being 36 inches in diameter with 4 1-2-inch tires in the rear and 4-inch tires in front; the weight with touring body is 3,000 pounds.

The single cylinder Cadillacs retain the copper water jackets used on former models,, two-speed planetary transmission with pedal for applying the slow speed and lever for the high, and safety starting device, by which the insertion of the starting crank retards the spark to a safe point in case it has previously been advanced. Frames are of channel steel. The brakes consist of two friction bands on the differential casing and are applied by a pedal with retaining ratchet. Ignition is by jump spark, two batteries of dry cells furnishing the current; the coil and switch are mounted on the dashboard. Throttle and ignition levers are conveniently placed on the steering wheel column. Axles are tubular, the rear axles being fitted with Brown-Lipe differential gears. Three-point spring suspension is employed, there being two rear springs and one front spring, the latter being attached to the car by a special rocker joint which permits great flexibility. Drive is, by a single chain with hardened rollers and detachable links. The front wheels run on ball bearings.

The lower parts of the bodies are finished in black, while the panels and doors are of a deep wine-color with light carmine striping. Dashes are of concave steel.



SMITH FOUR-CYLINDER SIDE-ENTRANCE TOURING CAR, WITH SHAFT DRIVE.

## Smith 1906 Models.

Two models, one a side-entrance touring car and the other a side-entrance surrey, constitute the 1906 line of cars manufactured by the Smith Automobile Company, of Topeka, Kan. Mechanically the cars are alike, except that the surrey has a motor of 20 horsepower, the cylinders having a bore of 4 1-4 inches and a stroke of 4 1-2 inches, while the touring car has more power, the motor being rated at 24 horsepower, the cylinders having a bore and stroke of 4 1-2 inches each. In both cases the motor is of the four-cylinder vertical type, placed under the hood in front; the cylinders may be had with jackets for water cooling or with flanges for air cooling. Drive is by special planetary transmission, giving two forward speeds, and propeller shaft and bevel gears to the live rear axle.

The framing is of ash and each main frame is stiffened by a longitudinal truss extending from end to end and passing under a king-post at the center. The motor is supported at three points; two arms cast, one on each side of the rear end of the crankcase, are bolted directly to the side frames, while the front end of the motor is supported at the center by a bracket bolted to the front cross frame. The transmission gear being of the planetary type, no flywheel clutch is used; a short shaft with a universal joint connects the motor shaft with the transmission. From the rear end of the transmission casing to the forward end of the bevel gear casing extends a steel tube, rigidly connecting these two parts; inside the tube runs the propeller shaft on roller bearings. The front end of the transmission gearcase is supported by a cross frame. Two braces run from the rear axle casing at the points where the spring seats are attached, to the propeller shaft tube about half way between the rear axle and the transmission. The differential is of the bevel gear type; the thrust of the bevel driving gears is taken by roller bearings, and the live shaft and rear wheels also run on rollers.

The motor has individually cast cylinders bolted to the aluminum crankcase, which is divided horizontally and carries the three crankshaft bearings in the upper half; hand holes are provided, so that the interior of the crankcase can be reached without removing the lower half. The cylinders are cast with integral heads, but the water jackets, which are also integral with the cylinders, have separate heads. The jackets surround the cylinders as far down as the top of the piston travels. The manufacturers state that the compression, with full throttle, is ninety pounds to the square inch. Piston pins are of hollow steel; the piston pin bearing of the connecting rod consists of a bronze bushing pressed into the bored-out end of the connecting rod. The big end bearing is of hard babbitt expanded into the rod by rolling; this end is split. The connecting rod is of steel of I-section. Inlet valves are automatic and are placed above

NORTHERN 7-HORSEPOWER RUNABOUT FITTED WITH FOLDING TOP AND WIND SHIELDS.

the exhaust valves on the right-hand side of the engine. To prevent unnecessarily wide opening of the inlet valves the regular valve springs are supplemented by heavier springs which come into play when the valve has reached the proper limit of its opening; the valve is stopped at that point and its stop cushioned by the extra spring. The exhaust valves are operated by cams and push-rods in the customary manner; the exhaust valve housing and stem guide have flanges cast on to radiate the heat and prevent the excessive heating of the valve stem. Ignition is by jump spark; the plugs are inserted in the center of the cylinder heads. A quadruple vibrator coil is mounted on the dash and current is supplied by two batteries of eight cells each. Ignition timing is controlled by a lever over the steering wheel, but not moving with the wheel. Lubrication is effected by a force-feed oiler driven from the engine; the transmission gears run in a bath of oil.

CLEMICK-HIRSCH TWO-TON, OPEN-BODY DELIVERY WAGON, WITH 24-HORSEPOWER DOUBLE-OPPOSED CYLINDER ENGINE.

Steering is by wheel, the steering post being telescoping; the post passes through the dashboard high up, leaving plenty of foot room. The steering gear is of the worm and sector type. Brakes are fitted to the rear hubs and to the transmission gear, and are operated by pedals.

The wheelbase of each car is 96 inches and the tread 56 inches; wheels are 34 inches in diameter and are fitted with 4-inch tires. The touring car weighs 1,900 pounds and the surrey 1,825 pounds. In the case of the surrey, the rear seat can be removed, converting the car into a runabout with a large rear deck, on which luggage may be carried. The bodies are finished in any color desired by the purchaser, the color not being applied until the car is purchased.

## Clemick-Hirsch Wagon.

The delivery wagon illustrated herewith, built by the Clemick-Hirsch Company, of 596 National avenue, Milwaukee, Wis., is propelled by a double-opposed cylinder horizontal gasoline motor rated at 24 horsepower and has a rated carrying capacity of 3,000 to 4,000 pounds. The car is strongly constructed and weighs empty 3,000 pounds; it is fitted with solid rubber tires on artillery wheels. The over-all length of the wagon is 12 feet 6 inches; the wheelbase is 102 inches. The part of the body available for carrying purposes is 6 feet long and 4 feet wide. The driver's seat is of such width that three persons can be carried.

The manufacturers state that the machine was built for the owner subject to approval after testing, and that the requirements have been fully met; after several months of actual service the car is said to have developed no weaknesses and to have given practically no trouble. The driver was an inexperienced man, but after a day's instruction from an expert had no difficulty in handling the wagon.

The manufacturers state that the success of this machine has caused the owner to order a second and similar one; also that a number of Milwaukee merchants have placed orders for delivery wagons for various classes of work.

## Northern Winter Equipment.

The manufacturers of the sturdy Northern runabout have decided to make few changes in this popular little car for 1906. It will still have the 7-horsepower, single-cylinder horizontal motor, planetary transmission and chain drive, giving two forward speeds and reverse. The wheelbase is 66 inches, track 55 inches, and the wheels are fitted with 28-inch by 3-inch detachable tires. Easy riding qualities are secured by the use of the Northern trunnion body hanger. To adapt the car to winter use or in stormy weather a folding hood and wind shields have been designed and the comfortable appearance of the car so equipped can be noted by inspection of the accompanying reproduction of a photograph.

## PREPARING FOR SHOW OPENING.

(*Concluded from page 5.*)

American and foreign cars will be seen side by side, and there will be ample opportunity for making comparisons. More than a dozen foreign makes will be shown, and some of the exhibits will be duplicates of those shown at the recent automobile show in Paris.

Coupon books for exhibitors are now at the armory show ready for distribution. A book containing four coupons for each day of the show will be issued for every twenty square feet of space occupied. Exhibitors will be allowed to purchase tickets in quantities at reduced rates for distribution among friends and customers, and these tickets are also ready for distribution.

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**The Berlin international** automobile exposition will be held from February 3 to 18, under the auspices and joint management of the German Automobile Club and the Association of German Automobile Manufacturers. It will be held in the Landes Austellungs Park, in a building admirably adapted for the purpose and affording 12,000 square meters of floor space all on the same level. The exhibition will be divided into five sections, as follows: 1—Automobiles for the transportation of passengers, and for sanitary, fire and military service; 2—Industrial automobiles; 3—Motorcycles; 4—Power boats; 5—Automobile parts and accessories, auto clothing, literature, drawings and touring maps. Space rental is at the rate of $7.14 a square meter for main floor booths and $5.95 a meter for wall space; outdoor exhibition space will be charged for at the rate of $2.78 a meter. Consul-general Thackara, of Berlin, suggests that in view of the popularity of the American runabouts and electric carriages, the great demand for motor vehicles for industrial purposes, and the decided improvement which has been shown in the construction of the higher grades of American cars, the Berlin exposition will afford a good opportunity for our American manufacturers to bring their products before the German public, and possibly to establish a lucrative and permanent outlet. He suggests that it may be practicable for our manufacturers who are represented at the Paris Salon to arrange for displaying the same exhibits in Berlin. All correspondence should be addressed to Managing Director Freiherr von Brandenstein, No. 16 Leipziger strasse, Berlin, W. Germany.

**A dispatch** from Portugal says that six tourists, while automobiling near Oporto, plunged down a steep hill and over a precipice, two hundred feet deep, into the River Douro. No trace has since been seen of of any member of the party.

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**Never use** fire in any form for warming up the carbureter; the game isn't worth the candle. Use hot cloths or boiling water.

# Letter Box

## Differentiation of Macadam and Earth Roads on the Topographic Maps.

*Editor* THE AUTOMOBILE:

[298.]—I enclose a copy of a letter that I have just written to Charles D. Walcott, of the Geological Survey, at Washington, on a subject that should be of general interest among automobilists, as it pertains to the designation of all good hard roads on the United States Survey maps, which would be of great value to tourists. If the idea seems a good one to you, can you not aid in its accomplishment either by publishing the letter or the substance of it?

AUGUSTUS POST.

*New York City.*

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Following is the letter, with a few omissions:

"With regard to differentiating between earth and stone roads and designating the same on the topographical sheets issued by your department, I beg to reduce the matter to the form of a letter in accordance with your suggestion.

"At the present time the differentiation, as I understand it, is between roads used and unused, a double line designating the former and a single line with a parallel dotted line designating the latter.* I would beg to suggest that what is known as a stone road, or a macadam road, be designated by a solid line or in any other suitable manner. The ground upon which I base this suggestion is:

"(1) That the difference between stone and earth is of sufficient importance to be noted, and is of as much importance as the marking of farm houses, churches, etc., and I should even think of more importance than the marking of small rivers and streams, equaling in importance the indication of navigable rivers and railroads. The number of these stone roads is not very large, and the work necessary to ascertain their location would not be difficult. Most of the important facts could be ascertained from the highway commissioners in those states which have this form of road supervision, and in others from the state government or actual field notes which you might have taken when any new work in this regard is projected.

"(2) In regard to the use of such information, I would say that such existing maps as are available are of a very inferior nature and have been given out to fill a very wide demand, especially among those who use the roads for traveling. The various states have issued from time to time maps showing roads constructed or work in process of construction. I enclose a copy of one compiled by the State Engineer's Department of New York, showing the extent and importance of the work projected within its borders. Massachusetts has issued a similar map, but it is not perfect.

"I beg to refer also to the work in which the American Automobile Association has been engaged during the last summer, that of getting out a series of maps at a cost of some $12,000, making tracings of the government maps wherever obtainable and making a red plate to go over all the roads which are of a superior character and following the main routes and highways of travel throughout New England and even as far west as Chicago. This immense amount of work was necessary to be done in most cases by personal investigation and actual travel over the important routes so designated. This work of course is supplemented by adequate directions, but if the government sheets had been as accurate in regard to the important highways as they were accurate in designating the byways, wood roads and mere rights of way, almost all of this work would have been simplified, and I think it is not idle to ask that, in view of the large amounts of money spent to improve the roads, they should be recorded upon the topographical sheets as well as on the topography of the country of which they formed a permanent and lasting feature.

"I may say, that, having traveled the National Highway of this country several times and the Appian Way leading from Rome, I have been impressed with the fact that the stone foundation of a road is as permanent and lasting as any of the works of man, and I think more lasting than the beds of some rivers. . . .

"The value of such differentiation of macadamized roads would be inestimable to the users of the roads throughout the country, and, coming at a time when the good roads improvement is becoming such a strong factor in political life, nothing would be so potent as a revealing of the good example set in various parts of the country. However, aside from any political or particular use, I think it would be sufficient merely to ask that stone and earth roads be differentiated in some manner that may seem to you proper."

*Wagon roads are indicated on the topographic maps of the United States "by fine double lines, full for the better roads, dotted for the inferior ones, trails by single dotted lines."

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## Owners' Responsibility Defined.

*Editor* THE AUTOMOBILE:

[299.]—Judge Gaskill, of the Massachusetts Superior Court, has lately made a ruling of much interest and importance to the owners of automobiles. Some of the local district courts have found owners guilty of "speeding," regardless of whether the machine was at the time being run by its owner or was under his control.

The case in which Judge Gaskill overrules this irrational doctrine is worthy of notice. Edward W. Taylor, of Lexington, son of the chairman of the Board of Selectmen of that town, operated during the season lately closed a line of "sight-seeing" (Knox) cars between Arlington Heights and Concord, passing through Lexington and along the historic Paul Revere route. On the very last trip made, on the last day of the season, the authorities of Lincoln (through a remote corner of which town the route lay) ambuscaded themselves by the side of a measured course, 330 feet in length, and timed the car. A fraction in excess of nineteen miles an hour was the speed alleged to have been made over this extended (sic) course on the up trip and a little more than twenty-two miles an hour on the return.

In the district court at Concord it was shown that the defendant, Mr. Taylor, the registered owner of the car, was not with it at the time complained of, but was in a neighboring town. The car was being operated by one of his employees, who held an operator's license. The venerable judge of that court promptly held that these facts constituted no defence and imposed the maximum fine (this being the defendant's first offence) of $25 on each count, or $50 in all.

The case was as promptly appealed by Mr. Taylor's counsel, and on December 15, in the Superior Court, the defendant was duly acquitted, the jury giving their verdict in obedience to Judge Gaskill's ruling that on the facts the owner had commited no offence. The judge said that the owner of an automobile, if present in the car when it is run in excess of the speed limit, *may be* held to be the guilty party, notwithstanding the fact that the machine is being operated by his chauffeur; but that to hold the owner responsible, though absent at the time and not shown to have instructed or authorized the chauffeur to run fast, would be utterly subversive of the fundamental principles of the criminal law. As well, he said, might an owner under such circumstances be held for manslaughter, if the chauffeur wantonly ran over and killed a person in the highway.

Robert P. Clapp, of Johnson, Clapp and Underwood, was counsel for the defendant.

E. W. T.

*Lexington, Mass.*

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**Although the automobile dealers** have not yet been able to convince the milkmen that an automobile will deliver milk without making butter, the brewery men seem to think that it is a safe and economical proposition to use motor trucks for their purposes. Many of the largest brewing companies both east and west have purchased motor trucks, and, from indications, these are giving satisfactory service. Among other things, the brewers say that no matter how much beer they put into an automobile, its navigating qualities do not seem to be affected. They are always reliable.

**"Aw—I have** £500 lying idle and aw—think I shall lay out £100 on a car."

"You won't get much for that. Why not more?"

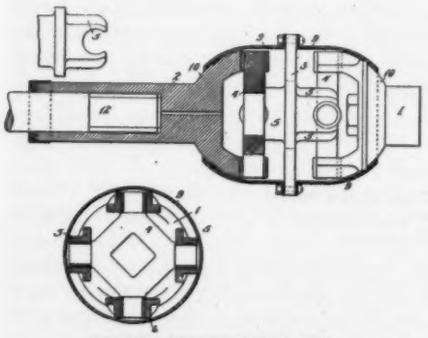
"You see—aw—I thought of reserving the balance for fines."—The English *Motor*.

# Patents

## Universal Joint.

No. 806,592.—C. W. Spicer, of Plainfield, N. J.

This is a double universal joint which performs the functions of the Oldham coupling in a somewhat more mechanical manner. It consists essentially of two separate universal joints of the ordinary Greek cross type connected by a forging *5*, which performs the function of a short shaft. The drawing shows also a square slip joint *12* for use when the universal coupling forms part of an automobile propeller shaft. The two forgings *1* and *2* are formed, as usual, with the forks *10*, in which the Greek crosses *4* are pivoted. The two crosses are pivoted also to the forging *5*, which connects them, so that the shafts can run with non-intersecting axle as well as with the



SPICER UNIVERSAL JOINT.

axles intersecting but not coincident. The coupling is made dust-proof by means of the covers *9 9*, which are bolted to a central flange *3* on *5*.

## Revolving Engine.

No. 806,125.—F. O. Farwell, of Dubuque, Iowa.

This patent covers the valve gear and special arrangements generally of the Adams-Farwell air-cooled engine, with stationary crankshaft and three radial cylinders revolving in a horizontal plane around the crankshaft.

## Steering Check.

No. 806,684.—H. Lemp, of Lynn, Mass.

This is a modification of the well-known Lemp steering check, the new feature being an arrangement adapting it for use with wheel steering. A small initial free movement of the steering wheel opens the valves in the steering check, permitting deflection of the front wheels.

## Gasoline Burner.

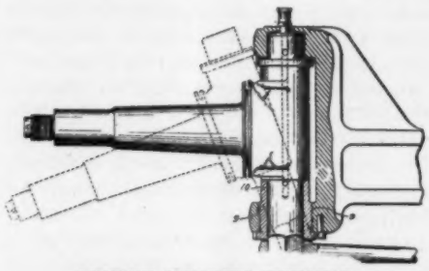
No. 806,308.—R. H. White, of Cleveland, Ohio.

This patent, application for which was filed December 3, 1900, describes substantially the present burner of the White steam car, although with some differences of detail.

## Steering Knuckle.

No. 805,716.—A. R. Demory, of Canton, O.

A construction giving a longer bearing at the base of the pivot than is afforded by the depth of the yoke forging at that point. A bushing *9* is threaded into the forging, and its upper portion *10* extends up as far



DEMORY STEERING KNUCKLE.

as desired. To dismount the parts, the bushing is removed, when the knuckle can be drawn down and tilted as shown in dotted lines.

## Starting Crank with Automatic Release.

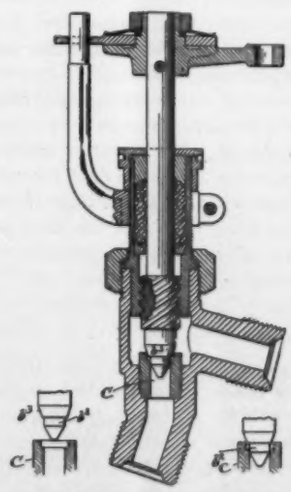
No. 806,583.—G. B. Selden, Jr., of Rochester, N. Y.

This is a starting mechanism in which the crank is pushed axially along its shaft to engage the crankshaft by means of a ratchet in the usual way. The automatic release consists of a roller ratchet engaged by a backward motion of the crankshaft and acting against a pair of cams to push the starting crank out of engagement with the crankshaft. Like all other devices of the sort, it requires a measurable backward movement of the crankshaft to cause it to operate.

## Throttle Valve.

No. 806,309.—R. H. White, of Cleveland, Ohio.

This is an improved form of throttle valve



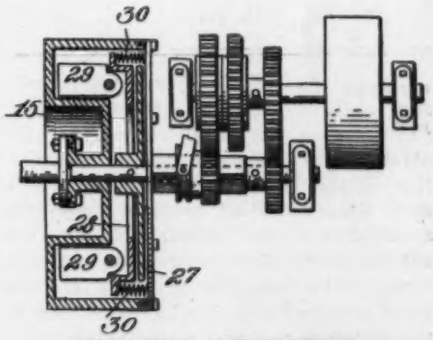
WHITE THROTTLE VALVE.

for high-pressure, superheated steam, and its object is to avoid to a large extent the cutting of the valve and its seat by wire drawing of the steam when the throttle is nearly closed. This is accomplished by dividing the valve into two elements, of which one closes the valve nearly tight, and is so formed as to stand a good deal of cutting before it becomes ineffective, while the second element closes the valve completely. In the drawing the first element is a cylindrical hardened steel plug $b^1$, which is a free fit in the hardened bushing *C*. This plug enters the bushing for an appreciable distance before the conical element $b^3$ closes the valve completely by seating against the counterbored upper end of C. Consequently it is not necessary to seat $b^3$ except to stop the vehicle completely, and all ordinary slow running is accomplished by the aid of $b^2$.

## Automatic Flywheel Clutch.

No. 806,377.—T. L. Sturtevant, of Quincy, and T. J. Sturtevant, of Wellesley, Mass.

This clutch is substantially similar to devices previously patented by the same inventors, whose object is to effect connection between the flywheel and the gears by the automatic action of the centrifugal clutch weighs *29*, which are so pivoted that when they expand they press the friction disks *27*, *28* of the clutch together. The improvement in the present invention consists mainly in the form of the disks, which are so arranged as see that their external di-




STURTEVANT CLUTCH DEVICE.

ameter is nearly the internal diameter of the flywheel *15*, thus making them more effective than when their diameter was smaller. When it is desired to stop the car the engine is throttled or the switch opened, whereupon, as the speed decreases. the springs *30* automatically disengage the disks.

## Steering Gear.

No. 806,612.—H. W. Alden, of Hartford, Conn.

A form of tilting steering column in which the reducing gear consists of a steep pitch screw and nut, and the steering column is tilted approximately about the trunnions which connect the nut to the bell-crank forging.

**Mysterious** obstructions in the supply pipe are sometimes caused by water in the gasoline collecting at a low point or pocket and freezing.

THE AUTOMOBILE

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***Outlook for 1906.*** The year 1906 opens upon conditions which are extraordinarily favorable to the American automobile industry. In the first place, the country is in a state of unparalleled prosperity, and the manufacturers have prepared to take advantage of this by having on the market, earlier in the season than ever before, the finest array of cars that has been seen in this country—cars that appeal to the prospective purchaser. For the first time practically all the manufacturers have placed their 1906 models on the market well in advance of the great shows, to which both builder and buyer have hitherto repaired to see what was new for the coming season. This certainly indicates a greater degree of confidence than has been displayed in former years.

The distributing centers for automobiles and for information regarding automobiles—the garages and salesrooms—have multiplied in number and increased in importance exceedingly; the old-established houses have expanded and erected buildings that are far in advance of anything of the kind in existence a year ago, while the newly established dealers profit by the accumulated experience of their predecessors. They handle better cars than have been hitherto built in this country, and sell them to appreciative buyers, whose knowledge of cars is greater than ever before. The increased number of distributing centers means an increased and more widespread knowledge of the automobile, so that 1906 will doubtless see a more rapid decrease of unreasoning prejudice, born of ignorance, than any previous season.

Activities in kindred lines of industry, which have been directly influenced by the development of the automobile, are also conspicuous. As an instance, the application of the explosion motor to the propulsion of railroad cars may be mentioned. Judging by the success that has attended the work carried out along this line, a new outlet for the energies of the motor builder has been found. There is also a constantly increasing demand for high-class motors for boats.

Owing to the widespread knowledge of the automobile and its uses, the accumulated experience of the builder and his knowledge of conditions, and the readiness of the merchant to take advantage of a profitable aid to business, the prospects for the development of the commercial vehicle—a field hitherto almost undeveloped—are better than ever before, and preparations for the occupation of the field are also far in advance of previous years.

Another great opportunity of the coming year is the foreign trade. For a long time the American builder has had so much to contend with that he has been content to confine his efforts almost wholly to his own country; but the opening of the year 1906 finds American cars so much better in every way than in any previous season that it is not surprising to find American builders placing their cars in foreign markets in open competition with the European machines. The American builder has a logical right to take a high place in export trade, for his cars have had to stand up to the same conditions of rough roads and generally adverse conditions that they will meet in India, for instance, or Australia, or South Africa, and are therefore eminently qualified to give satisfactory service.

As the year 1906 opens, the American manufacturer finds himself better equipped with experience than ever before—experience born of struggles against conditions that have brought his car to a necessarily high standard. With better cars, better facilities and a far wider field for 1906 than ever before, it will be strange if the new year does not prove to be the most prosperous that the automobile industry has yet experienced.

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***No Charges Against Race Commission.*** Mail reports from Paris printed this week show that no official charges have been made against the Vanderbilt cup race management by the international meeting of automobile clubs. We had really expected that this would prove to be the case when the foreign letters were received here, and the news will be received with satisfaction by those who have hoped for friendly international relations in automobiling. It is known, unofficially, that there was some excited comment on the management of the race made during the meeting by disgruntled or misinformed persons, a circumstance not at all surprising and likely to occur anywhere in any similar gathering. In these views the committee of the whole manifestly did not concur, and it would not be fair to the committee to give the impression that a wholly unauthorized and fragmentary newspaper report of the meeting was the deliberate expression of that body.

That there was a misunderstanding as to the status of the Automobile Club of America in conection with the race, and as to the conditions of the deed of gift, on the part of the German club, is shown by the statement of Count Stierstorpff. This statement, however, was met by the polite assurance of the American delegates that the matter would be laid before the Automobile Club of America; so that a friendly explanation and the consequent elimination of any cause for ill feeling is a certainty. It might be an opportune time for the A. C. A. to explain minutely to the associated international clubs its relation to the sport of automobile racing in America.

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***The Auto in its Commercial Aspects.*** An aspect of the automobile industry frequently lost sight of by the public in the contemplation of the automobile itself, but which is brought forcibly to attention by the erection in New York and elsewhere of a number of fine buildings devoted exclusively to the automobile, is the permanent investment involved in the marketing of the machines—an aspect that has only recently assumed large proportions in this country, but is rapidly and steadily growing, of necessity keeping pace with the development of the automobile itself.

When the automobile first came into commercial existence it was as an auxiliary, of doubtful merit, to some other line, and the accommodations required and provided for the housing and sales of cars were such as could be spared most conveniently. As the industry grew and more room was required, other lines became in many cases auxiliary to the automobile and were finally abandoned and the automobile was handled solely on its own merits. When this point was reached, special repair shops, storage rooms, salesrooms and garages became necessary; but the proportions assumed by the business at this time did not warrant the erection of special buildings, so that premises abandoned by other pursuits were necessarily secured. In many cases buildings formerly occupied as livery stables were found to provide the greatest possible clear floor space for storage and garage purposes. These, however, were obviously unsuited for showrooms and offices, and this led to the practice of having offices and salesrooms in one place and garages and storage space somewhere

else. The still increasing automobile business made it necessary in many instances to remodel old buildings and even build modest additions; and in some instances really excellent establishments were the result of the practical rebuilding of structures originally intended for other purposes.

Only recently, however, and with a swiftness that has been a surprise to those who are not closely in touch with automobile matters, the business has reached such important proportions that heavy, permanent investments are warranted, and as a result, the really fine buildings, completed and in the course of erection in New York and, to a proportionately lesser extent, in other cities, are seen. Two of the prime requisites in a building devoted to the automobile business are large, unobstructed floor areas, so that the machines can be conveniently handled and stored, and immunity from danger of fire. Both these requisites call for expensive methods of construction, so that the capital invested is necessarily large in proportion to the size of the building. Again, the matter of location is of no small importance, and the building sites selected are now in localities where real estate is expensive, so that the investment is accordingly heavier.

In New York automobile dealers have apparently selected as most desirable the district in the neighborhood of Columbus Circle, at the southwest corner of Central Park; and here block after block is occupied mainly by garages—fire-proof structures with enormous clear floor areas, with street fronts composed of huge sheets of plate glass; buildings notable for their suitability to the business and for their fine appearance. As an indication of the fact that ample capital is available for such enterprises, it may be mentioned that the plan of building beyond present requirements and leasing the extra space has also been followed.

The effects of all this are far-reaching, extending beyond the limits of the automobile business. Necessarily substantial and usually handsome business buildings, attracting a substantial class of customers to a locality, the garages add to the attractiveness of the districts they occupy and enhance the value of neighboring real estate.

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**The Paris** sporting daily, *L'Auto*, has delegated George M. Dupuy to act as its American representative on automobile matters. M. Dupuy, who is well known as a sportsman and explorer, has established his headquarters in the Dun Building, New York, and will contribute articles to his home paper dealing with the industry in this country.

**The order** issued in London last season closing Hyde Park to all electric, gasoline, steam or other automobiles and cycles between the fashionable hours of 4 and 7 P. M., during May, June and July, has been modified for next year, when electric carriages will be permitted within the park.

# No Gordon Bennett Cup Race in 1906.

(*From Our Own Correspondent.*)

PARIS, Dec. 20.—At the meeting of the international association of recognized automobile clubs, held here on Monday, it was voted unanimously that the Gordon Bennett Cup race should not be run in 1906. The Automobile Club of France will retain the cup at its headquarters during the year. Baron de Zuylen, the president, announced to the meeting that the Automobile Club of Italy had sent in a challenge for the Gordon Bennett Cup for 1906, and after a discussion, in which the delegates from the clubs of France, Austria, Germany, Portugal. Switzerland and Belgium declared their clubs would not compete in 1906, the vote was taken. Owing to there being no Gordon Bennett race, the international meeting, instead of being held twice a year, will not be held until the month of December, four or five days after the opening of the Paris show, contrary to the decision of the first conference of June 20, 1904.

This information is contained in the official report of the meeting which has just been given to the press. The delegates met at the Automobile Club of France on December 18. America was represented by J. Howard Johnson and W. S. Hogan, and delegates were present from Germany, Austria, Belgium, Spain, Great Britain, Italy, Portugal, Switzerland and France. Baron de Zuylen, who was unanimously elected president, expressed the deep regret of the assembly at the death of Clarence Gray Dinsmore, delegate of the Automobile Club of America, who had always shown the deepest interest in and devotion to the cause of automobilism.

On the proposition of the British delegate it was decided that in future propositions from any automobile club should be sent to the headquarters of the International Association of Automobile Clubs, Paris, in order that they may figure on the date and communicate with the other clubs at least ten days before the meeting.

After an exchange of views the conference decided that the dates of all automobile events organized by the different clubs forming the international association should be sent direct to M. Ward, secretary of the international association of automobile clubs, who will transmit them to the calendar commission as far as possible before September 1 of each year, so that this commission might submit its work to the international association before December 1.

It was decided unanimously that all international questions concerning motorcycle clubs should be centralized and treated by the recognized automobile clubs. and that no international correspondence should take place outside the recognized clubs. It was also unanimously decided that every disqualification pronounced by one club against a driver, a society or a firm should be notified the same day to all other clubs by telegraph and confirmed by registered letter. The disqualification must take place immediately and every club must acknowledge the receipt of the notice. It was decided that all disputes on races should be settled by the rules of the races, and that all objections must be substantiated by documents from the officials.

The German club had sent in a proposition for one annual automobile race, the expenses of which should be covered by each club, but Count Sierstorpff announced that they would withdraw it for the present.

The president was given power to admit the autombile clubs of Sweden and Roumania as soon as the rules and list of the committee of these two clubs shall have reached him.

The question of the suppression of the 10 per cent. discount given by certain tire manufacturers and constructors to chauffeurs was discussed without any decision being arrived at.

Count Sierstorpff referred to certain measures which had been taken during the Vanderbilt Cup race of 1905 without the approval of the official delegates of the Automobile Club of Germany. Messrs. Johnson and Hogan, representing America, took note of these observations and gave assurance that they would communicate them to the Automobile Club of America.

The American, Austrian, Spanish, British, Italian, Portuguese, Hungarian and French delegates, in view of the vexations caused to automobilists visiting Switzerland, advised the owners of automobiles as well as their friends to avoid visiting Switzerland. At the same time acknowledgment was made of the good intentions of the Automobile Club of Switzerland.

The Automobile Club of Italy was unanimously admitted to the international association, and the conference closed with an appeal from the Marquis de Dion for cooperation on the part of other clubs during the European Circuit of 1906.

Although not mentioned in the official account of the meeting, it is understood that a new conference will be held during July next to decide whether the Gordon Bennett race shall be run in 1907 or whether it shall be definitely abandoned. The opinion among the delegates is that the Gordon Bennett event is dead and buried, and one of the Austrian delegates probably voiced the general opinion when he declared that the Gordon Bennett Cup was "an interesting object for the museum."

From an interview with one of the most prominent members of the French club immediately after the conference it was learned that the Automobile Club of America was criticised, and the organization of the Vanderbilt Cup race of 1905 also by some of the delegates. No official vote appears to have been taken on the matter,

however, and the brevity of the mention in the report is confirmatory of the declaration of the French delegate referred to that the subject would probably not be mentioned in the official records of the meeting.

### INTERNATIONAL TOURING CONGRESS

The international congress on automobile touring, held during the Paris Automobile Show, brought forth reports, papers and discussions on practically every subject of interest to automobile tourists. A paper was read on the conduct of touring competitions, and means for reaching accurate conclusions were discussed. It was proposed that in order to secure uniformity in touring events every club should submit its rules to the A. C. F. before publishing them. It was proposed by another delegate that the A. C. F. should draw up a calendar of automobile events and that clubs desiring to hold contests should notify the A. C. F. at least sixty days in advance; and that the A. C. F. should give preference, in making up the calendar, to the early applicants. Another member proposed that France should be divided into sections for touring purposes, each section to have a central headquarters from which information would be disseminated, the division centers to report to a main headquarters; all the headquarters to be under the control of the A. C. F.

Road improvements were discussed at length and dust-laying compounds considered. All nations were urged to improve their roads and so widen the field of usefulness of the automobile both for commerce and pleasure. An active boycott of Switzerland was urged upon tourists. The perfect touring car and its equipment were discussed. The question of posting road signals was referred to, and the proposition made that the work be divided between the A. C. F. and the Touring Club of France.

Other subjects discussed were the automobile traffic of towns; rules of the road, of which a complete code was read and the proposition made that the code be adopted by France and all automobiling nations, and that a knowledge of the code be made an essential qualification of applicants for driving licenses; hotel accommodations, during the reading of which paper it was stated that 1,200 hotels had adopted the model bedroom suggested by the A. C. F.; the issuance of driving certificates and the conduct of automobile schools, it being suggested that schools give two grades of certificates, an ordinary and a higher grade; lights on automobiles; the influence of newspapers on automobile touring; legislation and taxes, the suggestion being made that automobilists be allowed to drive at any speed they choose, being, however, responsible to the common law for any resulting trouble; and maps.

**Cars** infrequently used should be jacked up to take the weight off the tires.

## Calendar Congress Schedule.

PARIS, Dec. 20.—The Calendar Congress held here yesterday arranged a schedule of dates for 1906, which, however, is merely a friendly arrangement and is neither final nor official. For 1907 the conditions will be changed, as all dates for that year will have to be definitely fixed by the Congress, which will meet in December, 1906.

About fifty delegates were present at the Calendar Congress held at the Automobile Salon yesterday, all the French automobile societies being represented. Foreign organizations were represented by Lionel Currie and W. Morris for the Motor Boat Club of America; Col. H. C. Holden and Lindsay Lloyd for the Automobile Club of Great Britain, and there were delegates from the Belgian, Austrian and Italian clubs.

The Autombile Club of France, although responsible for the calling together of the conference, was not able to fix the dates of its own important events, the Grand Prix and the endurance test over the European Circuit. These two events will be run during June and July and will probably cause some changes in the calendar for these two months.

Considering only the events of international importance, the 1906 season opens with the Brussels show in January, followed by the Berlin show in February. The Cannes fortnight and the Nice week are down for the month of March. April opens with the great Monaco meeting and the cruise from Toulon to Palermo. In May the first race for the Targa Florio will be decided; June sees the Herkomer Cup, the regatta at Kiel, and probably the endurance test organized by the Automobile Club of France. For the same month there is on the program an extraordinary contest for heavy wagons from Paris to London, organized by a French automobile journal, and which will probably never get beyond the initial stage. In July there is the French maritime week, the Ostend meeting, and probably the Grand Prix of the Automobile Club of France. The Ardennes Circuit, the Brescia Circuit, the Trouville Cup and the British maritime fortnight fill up the month of August. In September there is the Florio Cup, motor boat meeting at Arcachon, Mount Ventoux hill climb, and a road race for the Autocycle Cup of France. Chateau-Thierry and Gaillon hill-climbing tests occur in October, the Berlin Salon in November and the Paris Salon in December.

### PARIS TOWN CAR COMPETITION.

PARIS, Dec. 21.—The Town Vehicle Competition was run to-day over a total distance of sixty-two miles, on streets that were greasy and caused several minor accidents, but nothing serious. Out of thirty entries twenty-seven started, nine electrics and eighteen gasoline cars. Two American entries were barred out at the last moment because the jury decided that they were not within the classification of town cars; these were an Oldsmobile runabout and a Columbia electric runabout. Speed did not count in this competition, only regularity of running, elegance and economy of fuel consumption being taken into consideration. Twenty cars finished within the time limit specified; the winner, however, cannot be named until the points made by the cars have been worked out by the jury.

## Foreign News Notes.

Much to do about nothing! As soon as the French constructors desired a speed event the A. C. of France hastened to accede to their request in spite of the quires of paper that have been covered with the reasons why no speed contests would be held in 1906.

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Half a dozen leading Italian professional drivers, as Lancia, Cagno, Nazzaro, Cerano and Raggio, have been presented with medals by the Turin A. C. for their services in bringing the Italian industry into the front rank.

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The Sixth International Motor Show, arranged by the Austrian A. C., takes place in the Horticultural Hall, Vienna, from March 15 to 28.

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A new touring competition is to be added to the already long list of forthcoming events, in the form of a 4,000-kilometer tour Gold Cup of Milan, to be arranged by the Milan A. C.

**U. S. Consul McNally,** of Liege, furnishes a report on the value of Belgium's trade in automobiles, motorcycles, and bicycles from 1901 to 1904. In 1901 the total value of these machines exported was $542,428, and in 1904 $1,316,035, an increase of nearly $800,000 in four years. The value of automobiles advanced from $192,000 to $437,000, and motor cycles from $70,465 to $660,538. It appears that the exports were twice as much as the imports. In 1901 the total value of imports was $369,000 and in 1904 $669,000. It appears from the tables furnished by the consul, that in four years the exports of bicycles fell from 3,529 machines to 713, while the imports advanced from 2,967 to 5,417 in the same period. The exports of motor cycles advanced from 134 to 2,393, while the imports increased from 49 to 136. Germany is the principal competitor, as that country sends in a cheaper machine than the Belgian manufacturers produce. Of the 5,417 machines imported into Belgium in 1904 3,784 came from Germany, which is about 70 per cent. of the total. The Belgian manufacturers complain also that the duties of the various countries are almost prohibitive, while the Belgian duty is but 12 per cent. ad. valorem.

# Growth of Massachusetts Registrations.

BOSTON, Jan. 1, 1906.—That the registration of automobiles and the licensing of operators by the state is a very profitable business in Massachusetts is indicated by the figures of the automobile department of the Massachusetts Highway Commission for 1905, which will appear in the forthcoming annual report of the commission.

The books of the department for 1905 were closed last Friday, and up to that date there had been received in fees and turned over to the state treasurer the sum of $24,490.50. This is $5,000 in excess of the income during 1904, and more than $7,000 greater than the income during 1903, the first year of the operation of the registration and licensing law. The money is derived from fees of $2 for each automobile or motorcycle registered, and each ordinary or professional chauffeur's license granted, fees of $10 each for each manfacturer's or dealer's registration, and fees of 50 cents for each professional chauffeur's license renewed.

A new high mark was reached in 1905 also in the number of automobiles registered. Up to the close of the year 1903 a total of 3,241 automobiles and 502 motorcycles had been registered. For the year 1904 the figures were 3,772 automobiles and 489 motorcycles. During the twelve months just finished, however, a total of 4,889 automobiles and 533 motorcycles have been registered. The registrations of manufacturers and dealers have grown in proportion. In 1903 there were about 100 of these and about 100 have been added each year since. There are now in the state approximately 12,000 automobiles, the highest number plate being 11,661 and the highest manufacturer's or dealer's plate being 0282.

There are now 11,230 persons authorized to operate automobiles in Massachusetts in addition to several thousand professional chauffeurs. Last year 3,736 new ordinary operators' licenses were granted; in 1904 the number was 3,585, and in 1903 3,907. The 1903 figures, however, included all the operators there were in the state up to that time.

The growth of automobilism is demonstrated in the number of persons who have taken up the profession of chauffeur. When the report of the Highway Commission was issued on January 1, 1904, there were only 692 professional operators of automobiles in Massachusetts. In the ensuing year 1,335 more were licensed, and during 1905 2,362 persons were given credentials under which they may operate for hire. In addition to this, during 1905 the Highway Commission renewed 724 professional licenses which had expired.

## AUTO FIRE ENGINE FOR NEWARK.

NEWARK, Dec. 30.—At a special meeting the Newark Fire Commissioners decided to order an automobile fire engine, and the contract was awarded to the Amoskeag Fire Engine Company.

The engine, which will be the first of its kind in this section of the country, will cost $9,000, and will be delivered within the next four months. It will weigh 19,000 pounds, and its builders claim that it will pump five tons of water a minute. The fire commissioners went to Boston last week to witness a test of a similar piece of apparatus, which made a mile in three minutes, turned in its own length of sixteen feet, and stopped in its own length when going at full speed.

The engine will, in all probability, be stationed in the center of the city. It will be able to throw four streams at one time. It is propelled by steam, and it will be necessary to keep about eighty pounds of steam up while it is in quarters.

It is calculated that extra expense for additional steam pressure will amount to $75 a year. The present cost of feeding and caring for three horses is about $500 a year, and the commissioners feel that the auto engine will be a money saver in the end.

## PAID DOUBLE DUTY.

### Collection of Duty on Reimported Huntington Panhard Held Legal.

BUFFALO, Dec. 30.—Judge John R. Hazel, of the United States District Court of this city, to-day handed down a decision which is of interest and importance to automobilists, especially those owning foreign-made machines. The case was an action of J. T. B. Hillhouse, of New York, against the United States to recover the assessment of 45 per cent ad valorem duty on a machine brought to New York from France. The automobile is owned by the widow of the late Collis P. Huntington, of New York, and the action was brought by Mr. Hillhouse as agent for the estate of the deceased.

The automobile is of Panhard-Levassor make, 1901 model. limousine body, and is valued at $24,000. It was originally imported from France in 1902 and the duty was paid upon it. In August of 1903 the machine was exported to France, but after first being registered at the New York customs house to avoid payment of duty on its return to this country. While abroad, however, the machine was subjected to extensive repairs. The motor was overhauled, new parts substituted in place of old, and the body had been repaired and newly upholstered just prior to the return.

The Huntington estate claimed the machine should be admitted free of duty, but on its entry at New York 45 per cent. was assessed. Objection to the assessment was made, but the Board of General Appraisers at New York upheld the customs collector. Judge Hazel holds that the duty was proper and says:

"The conclusion is sound, I think, that the machine while abroad received such extensive repairs as to improve it materially in condition beyond its condition when exported. The decision of the Board of General Appraisers is approved."

This decision compels the second payment of duty on the machine when imported. The duty of 45 per cent. upon the invoice of $24,000 is $10,800. Judge Hazel heard the appeal in this case while holding a term of court in New York several weeks ago.

## SEATTLE-TACOMA BOULEVARD.

SEATTLE, Dec. 29.—The construction of a permanent boulevard between this city and Tacoma is the object sought to be attained by instructions given County Surveyor Valentine by the county commissioners. Surveying for a route is to be commenced immediately.

There is at present a road between the two cities, but it is not in the best condition. The cities are about thirty-five miles apart by road, and much of it is picturesque, although not on the same scale of grandeur as the road to Mount Tacoma. The purpose of the new road will be more for the diverting of traffic to the two cities, although it will prove a valuable addition to the Mount Tacoma road, with which it will connect directly.

The new road is to be macadamized and will be the first scientifically constructed wagon road in King county. It will be known as the Seattle-Tacoma boulevard, and the Good Roads Association advocates it as a beginning of a pike to extend from the Canadian border at British Columbia through Washington, Oregon and California to the Mexican boundary line.

The road records of King county are at present in bad shape, but the Good Roads Association of the county has now taken the matter up in an energetic manner, and County Surveyor Valentine has already commenced the work of getting them into shape, and preparing a map showing the 1,200 miles of roads in the county. This data will further be used in the extension of the proposed pike. It is recognized that this work must be done systematically. At present, roads do not exist where records show them to be located. From this it can be seen that a vast amount of detail work is before the county surveyor. But now that the work has been undertaken, it will undoubtedly be pushed to a satisfactory completion, and should prove very valuable to the automobilists.

## PHILADELPHIA LICENSES HELD UP.

PHILADELPHIA, Dec. 30.—Local automobilists were overjoyed to-day when Chief Justice Mitchell, of the Supreme Court of Pennsylvania, issued a supersedas at the request of Ira J. Williams, representing the

Automobile Club of Philadelphia, restraining the city authorities from issuing city automobile licenses until his tribunal has heard argument in the case. This may mean a temporary lull in the legal battle of at least six weeks, as the Supreme Court's next session is not due until the middle of March. Attorney Williams has, however, asked the court for an early hearing, and it may be that Chief Justice Mitchell will grant the request.

This means that the new state law goes into effect here Monday and that the city must keep hands off the automobilists until the court hears the case and passes judgment. The plan of the club to have one of the members arrested for not displaying the municipal tag is, of course, postponed for awhile, and if the club wins it will be for the city to make the next move. If the court permanently restrains the city from issuing licenses the latter will, in all probability, give up the fight, for almost all the interested parties are of the opinion that the state law was intended to supersede the numerous local ordinances with their manifold provisions as to speed.

Meanwhile the state is issuing licenses and getting the fees, while at the Bureau of Boiler Inspection, in the City Hall, the work has ceased.

### AUTO TOURNAMENT ON THE ICE.

MUSKEGON, Mich., Dec. 30.—One of the most peculiar automobile events ever held in the State is planned by the Muskegon Automobile Club for the latter part of February. This is an automobile tournament on the ice of Muskegon lake, so-called, but which is really the harbor on Lake Michigan at this point. The lake is five miles long, and a straightway track will be laid on the ice for that distance. Arrangements have been made to spread hot cinders on the ice, making a path about forty-eight feet wide. The heat of the cinders will cause them to become firmly implanted, and it is expected that this will form an excellent track.

The automobile club will secure the sanction of the A. A. A., says Dr. C. J. Dove, the president, and will endeavor to make the affair one of the biggest and best ever held in the State. The events, which will be from one to five miles, will be open to all.

Besides the automobile races, there will be motorcycle events in which members of the local motorcycle club will probably contest with outsiders. A silver cup and other prizes will be offered.

**A motorist** in Bavaria has had to appear before the authorities at Munich on the ground that he had used a trumpet to give warning of his approach, instead of the more usual horn, blown by rubber "pear." He argued that, though the law stated that a horn was necessary it did not define how the horn was to be blown. After a long discussion he was acquitted.—*Exchange.*

## CHICAGO CLUB TO BUILD.

### Papers Signed for Site Outside of "Loop." —Spring Touring Race

CHICAGO, Dec. 30.—At a meeting of the Chicago Automobile Club directors on Friday it was definitely decided to erect a new clubhouse, but the details are withheld owing to complications which may arise over the real estate matters. It is known, however, that the new building will not be put up inside of the elevated railroad loop. A full attendance marked the meeting, the first time that such a thing has occurred in months. Ira M. Cobe, former president of the club, presented the report of the clubhouse committee and it was approved. The necessary papers were also signed, so that matters have come to a head at last. Plans for the building will be made by B. H. Marshall.

A touring race will be held in the spring which is of interest not only to local automobile enthusiasts, but to automobilists in general. Jerome Ellis, a director of the Chicago Automobile Club, is making elaborate plans for the event. It will be a contest for touring cars for a $1,500 cup, which has been presented for the event by E. F. Meyer, a member of the club. The run will be either from Chicago to Milwaukee, or from this city to South Bend, Ind., and the cars must be fully equipped and must carry four passengers each. Mr. Ellis also offers a cup to be presented to anyone who breaks his (Mr. Ellis's) records to either of the two cities. His record to Milwaukee stands at 3 hours 31 minutes, and to the Indiana city at 3 hours 35 minutes. The race is scheduled to come off May 1.

### HAD AN AUTOMOBILE SUPPER.

PHILADELPHIA, Jan. 1.—There is a jovial body of young men in the Union League of Philadelphia who have formed an inner organization called the Hearth Club. They meet at intervals to eat and talk, and as the majority of them are automobilists, their last meeting of the year, held last Saturday night, took the form of an automobile supper. The table was so constructed as to represent a long car. The president of the club, Herbert Darlington, was at the wheel, while the guests occupied the long running board at either side of the car. The waiters were rigged out in chauffeur's rig, and a lot of fun was had listening to the impromptu speeches on things automobiling and the merry jokes of a black-face troupe of entertainers.

### MINNEAPOLIS FLORIDA SPECIAL.

MINNEAPOLIS, Dec. 30.—Reservations for the special train that the Minneapolis Automobile Club is going to run to the races in Florida the week of January 22 are coming in rapidly, and it is expected that the accommodations will all be taken before the middle of January. Fifteen have come in from the Chicago A. C., and requests for information are being received daily. On the return trip a few hours will be spent in Chattanooga to visit Lookout Mountain, Missionary Ridge, and other places of historic interest. Those who wish to see the Chicago show may do so on a special ticket extension good for thirty days.

## WASHINGTON TRADE THRIVES.

### Dealers Planning to Meet Demand for Big Cars and Early Deliveries.

WASHINGTON, D. C., Dec. 30.—Material prosperity and extension in all directions characterized the automobile trade of this city during the year just closed. It was the greatest year the local trade has ever had and there is not a single dealer who is not eminently pleased with what the year brought forth.

Firms like the Cook & Stoddard Company, with the Locomobile, White, Franklin, Cadillac and Baker; the Pope branch with the full Pope line; Charles E. Miller & Brother, with the Ford; the Washington Electric Vehicle Transportation Company, with the Columbia line; the Wayne Automobile Company, and the National Automobile Company, with the Packard, Buick, Oldsmobile and Studebaker, did the cream of the business, but other agents got their share also.

The year was remarkable for the demand for higher-powered cars, and in many cases the cars could not be obtained to fill orders owing to the inability of the manufacturers to supply them. The dealers are now planning to insure early deliveries and an adequate supply of big cars.

The selling season is expected to open much earlier in 1906, owing to the fact that the local automobile show will be held nearly two months earlier than in any previous year. The armory of the Washington Light Infantry has again been secured for the show. The date selected, February 3 to 10, is satisfactory to all concerned.

### GOBRON BRILLIE AGENCY.

E. V. Hartford, president of the Hartford Suspension Company, who has been in attendance at the Paris Show, has secured the American agency for the Gobron-Brillie car, which is one of the fastest cars of Europe. A. G. Hoffman, treasurer of the company, says the French car will be sold from the new factory and garage that is being built at Eighty-eighth street and Broadway, New York. The building will be 100 by 50 feet, two stories and basement, and will contain the factory for Hartford suspensions, the office and salesroom and all garage conveniences.

L. C. Burnett has been made sales manager of the company, while Carl Stevens will travel throughout the country establishing agencies. Hartford suspensions will be shown at both shows in New York. The Pope Manufacturing Company's branch has secured the agency for the suspension in Washington.

## PROSPERITY IN INDIANAPOLIS

### Manufacturers to Build 2,000 Cars Aggregating $4,105,000 in Value.

INDIANAPOLIS, Dec. 30.—Figures obtained from the five automobile factories in this city show that local concerns expect to manufacture more than 2,000 automobiles during the year 1906. These figures, although large, are conservative and are based upon the extraordinary business during the year just closed.

Local manufacturers estimate that 30,000 cars will be manufactured in the United States in 1906 and say that of this number 8 per cent. will be made in Indianapolis. Accordingly they have dubbed Indianapolis "The Auto City."

All of the Indianapolis factories have many orders booked ahead and have unusually large forces of workmen at work. Despite this fact, it is probable that most of the factories will be behind in their orders before many weeks. The Premier Motor Car Company has just completed a large addition to its plant and other companies expect to enlarge their establishments before the new year has closed.

The Premier people are figuring on manufacturing 600 cars next year in five models, not including a truck, estimated at a total value of $1,000,000. Other local concerns estimate their 1906 output as follows:

Pope-Waverley Factory, 600 cars, fifteen models. $900,000; Nordyke & Marmon, 200 cars, two models, $540,000; National Motor Vehicle Company, 350 cars, $1,000,000; Marion Motor Car Company, 300 cars, $665,000.

The new year will find practically every automobile dealer in this city handling a different line of cars from that he has handled in preceding years. With one or two exceptions the agency for every car in Indianapolis has been changed for the year 1906, and several makers find themselves now represented in the city for the first time.

The past year has been the most prosperous in the history of local dealers, and the coming year is looked forward to as another record-breaker. Many garages have been greatly improved and enlarged in anticipation of extraordinary business. The Gibson-Short Cycle and Auto Company is preparing to build a large addition, and it has already occupied another showroom that doubles its space. The Fisher Automobile Company is erecting a third story to its garage, and the Indiana Automobile Company has made extensive improvements that give it more space for display purposes.

Agencies for 1906, as placed to date, are as follows: Fisher Automobile Company, Premier, Maxwell, National and Stoddard-Dayton; Gibson-Short Cycle and Auto Company, Reo and Marmon; H. T. Hearsey Vehicle Company, Rambler, White and Pope-Waverley; Indiana Automobile Company, Winton, Oldsmobile, Auto-Car, Cadillac and Ford; Columbia Electric Company, Leader; Federal Automobile Company, Stevens-Duryea; Lemon Automobile Company, no agency placed; Sears Brothers, no agency placed.

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### DEVELOPMENT IN SOUTH BEND.

SOUTH BEND, IND., Dec. 26.—The manufacturers of the Studebaker automobiles have just moved into a substantial new factory building that will add 250,000 square feet to the big plant that now occupies 110 acres of ground here, fifty acres of which are under roof.

One of the Studebaker representatives has just returned from Italy and France, where the Studebaker Automobile Company has good business prospects for the coming year. It is claimed that the Studebaker car recently made a tour through those countries without having incurred a penny's worth of repairs.

One of the engineers of the company has made a trip through Europe in search of new devices, and recently returned to the factory.

The Studebaker company will have a fine exhibit at the coming Chicago auto show.

In this famous vehicle town automobiling is undergoing a great development. The roads have remained good until Christmas and none of the big and costly cars have yet gone into the garage for the winter.

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### RECENT INCORPORATIONS.

Ansonia Automobile Co., New York; capital, $5,000. Directors: E. G. Potter, G. R. Kelso, F. W. White.

Chadwick Motor Car Co., New York; capital, $50,000. Directors: A. W. Pross, C. E. Reed, George Muirer.

Imperial Electric Motor Co., Toronto, Canada; to manufacture power machinery, automobiles, etc.; capital, $200,000.

Huntington Automobile Co., Huntington, N. Y.; capital, $5,000. Directors: A. Hecksher, F. H. Berthold, G. C. Fraser.

Carlson Automobile Co., Brooklyn, N. Y.; capital, $15,000. Directors: C. A. Carlson, Chalmers Dale, Jr., C. W. McKelvey.

Gearless Motor Cycle Co., Rochester, N. Y.; capital, $50,000. Directors: A. L. Sweetland, R. Burns and M. A. Harrison.

The Treacy Automobilium, Ltd., New Orleans, La.; capital, $50,000. Directors, W. J. Tracy, W. P. Tracy and William Bradley.

American Motor Car Co., Indianapolis, Ind.; capital, $25,000. Incorporators: W. A. Moore, W. E. Barton and C. R. Cameron.

Austin Automobile Co., Newark, N. J.; capital, $25,000. Incorporators: Herbert Austin, T. G. French, Jr., and Charles Krebs.

Weed Chain Tire Grip Co., New York; manufacture vehicles; capital, $100,000. Directors: H. D. Weed, H. P. Denison, H. E. Chase.

Westchester Motor Car Co., New Rochelle, N. Y.; capital, $25,000. Directors: K. S. W. Glasser, J. A. Mahtstedt, F. W. Bender.

Bransstetter Motor Co., Chicago, Ill.; capital, $2,500; operate garages. Incorporators: H. P. Bransstetter, H. H. Look, O. M. Schultz.

Automotor Transfer & Storage Co., Orange, N. J.; capital, $45,000. Incorporators: J. A. Ball, L. A. McNulty and A. P. Bachman.

Hicks Speed Indicator Co., Brooklyn, N. Y. (manufacture speed indicators); capital, $3,000. Directors: E. P. Hicks, C. R. Johnson, Carl Knoff.

Atwood Automobile Co., Toledo, O.; capital, $40,000. Incorporators: H. M. Smith, D. D. Flanner, R. H. Baker, D. V. R. Manley and Frank Mulholland.

American Continental Caoutchouc Company, Chicago, Ill.; capital, $10,000; to deal in tires. Incorporators: Harrison Musgrave, J. B. Gascogne and J. H. S. Lee.

Broderwisch & Glancy Automobile Co., Dayton, O.; capital, $25,000. Incorporators: Edward Borderwisch, E. M. Glancy, O. C. Waveries, L. Y. Cooper and W. G. Powell.

Twombly Motor Car Co., New York, to manufacture engines; capital, $1,000,000. Incorporators: Charles C. Dodge, T. Wayne Murray, A. V. Remsen and Edward C. Billings.

The Covell & Crosby Motor Co., Bay Shore, N. Y.; manufacture and deal in automobiles, etc.; capital, $20,000. Incorporators: E. L. Tamblyn, J. I. Bergen, W. P. Barker.

Watertown Automobile & Supply Co., Watertown, N. Y.; manufacture and deal in automobiles and automobile supplies; capital, $5,000. Incorporators: L. G. De Cant, P. A. Pitcher and J. A. McConnell.

Chesapeake Launch & Motor Co., Norfolk, Va.; capital stock: maximum, $15,000, minimum, $5,000. Incorporators: F. W. McCulloch, president; J. S. Taylor, vice-president; F. W. Culpepper, secretary and treasurer.

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**A novelty** of the Paris Salon is a motor road-skate, which, fitted to the feet, is said to take the "rider" at a speed of twenty-five miles an hour. Beneath the plate for the foot, instead of a runner or boxwood rollers, are four small wire, rubber-tired wheels, carrying between them a tiny air-cooled, single-cylinder engine at an acute angle to the ground. At the rear is a little gasoline tank. The engine is direct connected to the rear axle, while the front wheels are mounted on a bogey. Ignition is by battery and coil. The price asked is $120 a pair.

**Sometimes the engine can be started on a cold morning by partly stopping up the main air inlet, so as to produce practically the same effect as flooding the carbureter.**

# News and Trade Miscellany.

The Elmore Manufacturing Company, of Clyde, O., makes the announcement that it has acquired a basic patent covering the essential features of the two-cycle gasoline motor, and that other manufacturers of two-cycle engines must negotiate with the Elmore Company if they desire to continue the manufacture of this type of motor. The patent in question was owned by Joseph Day, of Rumford, England, who convinced the Elmore Company of the validity of his claims and sold to the company the American rights. The patent has only a year to run before expiration.

The 4-horsepower car built by Henry Ford in 1891, on which the contest against the Selden patent suit hinges, is on view at the New York branch of the Ford Motor Company, at 1723 Broadway, side by side with the latest Ford model, a six-cylinder car. Much attention is attracted by the intrinsic interest of the cars and by the contrast between the old and the new.

A suit brought against the Grout Brothers Automobile Company, of Orange, Mass., by Miss Helen Walker, of St. Louis, Mo., for the purchase price of an automobile said by the plaintiff to have been inferior to the representations of the manufacturers, has been won by the defendants. Miss Walker bought a Grout steam car at the St. Louis Exposition, and later exchanged it for another of the same make on the ground that the first car was defective. The suit was brought on the allegation that the second was defective also, but the jury found for the defendant.

Under the name of The Mechanical Advisory Board, a company composed of expert mechanics and engineers has been formed in Chillicothe, O., and incorporated under the laws of the state, for the purpose of investigating and giving expert opinion on the merits of inventions with a view to saving inventors the expense of taking out patents for worthless devices, and, on the other hand, to encourage the development of practical inventions. The originator of the plan was B. A. Gramm, of the Logan Construction, of Chillicothe, who, is one of the incorporators and president of the company. His associates are B. W. Twyman, vice-president; Fred Biszant, secretary and treasurer; Charles Elliott, chief engineer, and C. K. Probst, chief draftsman. A fee will, of course, be charged for passing upon an idea.

A tire competition on novel lines has been planned by the Pennsylvania Rubber Co., of Jeannette, Pa., $1,000 in cash being offered for prizes. All users of Pennsylvania tires are eligible as competitors, and the winner will be the automobilist who finishes the season of 1906 with the least tire expense per mile run; a minimum distance of 2,500 miles is set. Prizes will vary from $500 for first prize to $10 for ninth prize. A book on the care and handling of tires will be given to each competitor.

First Vice-President Albert Pope and Second Vice-President C. E. Walker, of the Pope Mfg. Co., of Hartford, Conn., were in Philadelphia last week, as was also Henry Goodman, of the Pope-Waverley factory, of Indianapolis, Ind.

The Fiat is the latest car to secure representation on Philadelphia's "automobile row." H. Allen Dalley, local agent, established headquarters last week at 215 North Broad street.

A. H. Chadbourne, of the Cape May Automobile Club, contemplates running a series of "matinee" auto races at that resort next Summer at fortnightly intervals.

R. E. Olds, president of the Reo Motor Car Company, has completed arrangements with the Seaboard Air Line for transportation to the Florida races for himself and a considerable party. Officials of the Maxwell-Briscoe Motor Car Company, including Benjamin Briscoe, J. D. Maxwell, C. W. Kelsey, H. E. Randolph, A. S. LeVino, and others, are also negotiating with the Seaboard for extensive accommodations. A. L. Kull and party, of the Wayne Company, have leased the private car *Sunbeam*, to be hauled on the Saturday midnight train known as the "Ormond two-miles-a-minute Special."

Frank Rantz and family, of Bridgeport, and Judge Archer and family, of Greenwich, Conn., who are making a pleasure trip from Bridgeport to Los Angeles, arrived in Buffalo recently. There are seven people in the party and they are using a Maxwell runabout and a Maxwell touring car. They reported a fine run between Bridgeport and Buffalo, no accidents of any sort and no repairs necessary. They resumed their journey after a day's rest. Neither of the cars required any attention beyond a cleaning of mud from the wheels.

Sales Manager Howell, who is in charge of the Decauville Company's Franklin business, is much elated by the appearance in New York of the first six-cylinder Franklin touring car received in that city. W. F. Winchester, who drove in the elimination race for the Vanderbilt Cup, drove the car from Philadelphia and has been showing it and giving demonstrations of its power. The car is known as Type H, is of 30 horsepower and has a 114-inch wheelbase.

Until last Spring there was not a garage or an auto repair ship in Portsmouth, N. H. Now there are four, and a fifth is assured, that, with the opening of the season, shall surpass all the others in facilities for repairing and supplying automobiles.

Carl H. Page, manager of the New York branch of the White agency, and Mrs. Charles H. Page, his mother, returned to their home in Worcester, Mass., on Sunday, Dec. 24, after a six weeks' tour of Italy, Switzerland, and France. Mrs. Page is a native of Berne, Switzerland, and her recent visit there is the first since she came to America, nearly forty years ago. Mr. Page represented the White Company at the Paris show. After spending Christmas with his parents, he hurried to New York to perfect arrangements of his company for the coming show at Madison Square Garden.

Manager W. B. Hurlbut, of the Packard Motor Car Company, of New York, will go to Ormond, and while there will probably drive one of the new fast 1906 runabouts now being made by the Packard company.

Two thousand miles have been traveled by the Thomas Flyer used for demonstrating in New York. Included in the mileage is a round trip journey to Wilkesbarre and a climb up the Wilkesbarre Mountain road in record time.

Negotiations are in progress at Washington, D. C., for a garage for the Washington branch of the Pope Motor Car Co. A portion of the Pope building on Fourteenth street has heretofore been used for garage purposes, but it has been found necessary to utilize this space for displaying cars, hence the imperative need of a separate garage. A. L. Pope and Charles Walker were in Washington last week and secured an option on a three-story building on Sixteenth street.

J. C. Pettepher, proprietor of the Florida East Coast Garage, Daytona, Fla., after experimenting for two years with a metal composition with which to mend sand-holes, cracked cylinders, or in fact any crevice or flaw in cast-iron and other metals, is now preparing to market the composition, which he has been using for some time in his repair work, and which he states is soft and pliable while being used, but quickly hardens without contraction.

Two recent sales of Smith & Mabley 1906 Simplex cars were made through Con Baker, Philadelphia agent for the company, to John W. Woodside and Robert M. Janney, both of Philadelphia. A third sale negotiated through their Philadelphia agent was that of a Panhard to Harry W. Harrison.

What was formerly the Wheeler Manufacturing Company, of Detroit, Mich., has become the Rand Manufacturing Company, the corporation name of the concern having been changed. The company makes the "Rand" canopy, cape and extension tops.

The White Sewing Machine Company has established an agency in Brick Church, N. J., with B. F. Adams. The New Haven representative for the company is W. P. Frost, of 666 State street. J. M. Dickson, Federal street and Fifth avenue, Troy, N. Y., will look after the company's interests in this city.

Mr. Foster, manager of the Chicago agency for the Cadillac, who also controls the district of Illinois for the company, intends to establish a number of new agencies in various parts of Illinois for the sale of next year's cars. There are at present about twenty-six of these branch stores throughout the state, but Mr. Foster hopes to double this number.

Manager W. F. Smith, of the Rambler branch in Philadelphia, has given hurry orders to the renovators to put the Broad street salesrooms and the uptown storage and repair plant in shape for the 1906 campaign. Both buildings are being rearranged to facilitate the expected enlarged business of the coming season. Similar repairs are in progress at the garage of the Quaker City Automobile Company.

The first consignment of English Daimler cars has been received by the English Daimler Company and placed on exhibition at the new salesrooms of the Decauville Automobile Company, New York agents for this car. The first shipment consists of four cars, two of 28-36 horsepower and two 30-40 horsepower, one of the latter a chassis.

The New York premises of the Continental Caoutchouc Company, at 43 Warren street, consist of a double-front store extending back 75 feet, under which are two basements. The ground floor is used exclusively for offices, while stock is kept and repair work done in the basements. The repair work is in charge of experts sent from the factory at Hanover, Germany. The repair department is divided into two rooms, one for building up and the preparatory work, and the other for vulcanizing. The work is done in the same way as at the factory in Germany.

Allan H. Whiting has been appointed sales manager of the Autocar Company, Ardmore, Pa., to fill the vacancy occasioned by the resignation of Marcus I. Brock. Mr. Whiting was formerly sales manager of the Edison Storage Battery Company, Orange, N. J.

Charles E. Miller, the well-known jobber, has opened a branch house at 824 Main street, Buffalo, and another in Detroit at 227-9 Jefferson avenue.

The Automobile Trade Credit Association was formed in New York at a recent meeting of representatives of dealers in automobiles and accessories and supplies, about sixty concerns being represented either by delegates or by letter. A permanent organization was effected and incorporation papers prepared; by-laws were adopted, and a board of seven directors elected. F. J. Alvin, manager of the American Electrical Novelty and Manufacuring Company, was elected president of the association, and Franz Neilson, of 80 Wall street, New York, secretary and counsel. The objects of the association are the protection of members from unscrupulous purchasers who abuse their credit; the detection of frauds; the dissemination of information as to the standing of buyers; the collection of old accounts; the settlement of differences between members, or between members and their customers, and so on.

An expression of appreciation for the courtesies received during the past year from the press, the Panhard & Levassor American branch entertained the New York automobile writers at the Café Martin on Saturday evening, December 30. Andre Massenat, president of the American branch, presided over the feast, while A. de Magnin, assistant manager, was his able assistant; Thomas J. Moore was toastmaster. Messrs. Massenat and de Magnin welcomed the guests in the name of the parent company. The evening was made particularly enjoyable by the happy manner in which the toastmaster introduced the speakers of the evening, and the equally apt responses made by the guests.

One of the first of a number of delivery vehicles has just been completed by the Premier Motor Car Company for John Wanamaker, of Philadelphia. The car is pronounced by its owner to be the handsomest now owned by him. It has a capacity of 1,500 pounds and is designed for small-package delivery.

The Branstetter Auto Company, of Chicago, has changed its name and will hereafter be known as the Mitchell Company.

The Frayer-Miller Automobile Co., of New York, will be located hereafter at the corner of Sixty-fifth street and Broadway. Their present quarters have been re-leased to C. B. Rice, of the Baker agency. Manager Knepper received last Wednesday the first of the four-cylinder 1906 Frayer-Miller cars and is now arranging demonstrations.

The Rainier Company's Chicago branch will be located at 1255 Michigan avenue, the quarters formerly occupied by the A. C. Banker Company. The Chicago branch will be in charge of E. L. Cordner, who was for many years right-hand man for Klaw & Erlanger.

The H. H. Franklin Manufacturing Company, of Syracuse, N. Y., states that Franklin cars are being ordered for shipment to Mexico, Yucatan, Porto Rico and Canada. A. H. Frazer, secretary to Governor Winthrop, of Porto Rico, is a recent purchaser of a Franklin. Mr. Frazer has owned two Franklins of earlier models. The company reports a very brisk business.

A. J. Pickard, lately with the American Darracq Auto Company, has become associated with the Rainier Company, of New York City.

The National Automobile Co., of Washington, D. C., is planning to open a downtown salesroom where the Packard, Buick, Oldsmobile and Studebaker cars can be shown to better advantage than at the garage on Fourteenth street. The company will take on another large car some time in January.

The Florio Cup race, which is the great Italian automobile event, held for the first time in 1905, was won by an Italian car, fitted, according to the Hess-Bright Mfg. Co., of 245 North Broad street, Philadelphia, with D. W. F. ball bearings, of the type manufactured by the Hess-Bright Co.

The Dayton Electrical Mfg. Co., of Dayton, O., announces that the lead bottle Apple storage battery has met with such success that facilities for manufacturing it have been doubled. This concern has brought out a new storage battery charger which keeps the battery charged while the car on which it is used is running.

The Gray Motor Company, of Detroit, Mich., has incorporated with a capital stock of $12,000. Four thousand dollars has been paid in, half in cash and half in models and designs used in the manufacture of Gray power boats and engines.

The Pontiac Motor Company, a new automobile concern organized in Pontiac, Mich., has elected the following officers: President, Dr. V. H. Wells; vice-president, George E. Fisher, of Detroit; secretary, Albert Burton; treasurer, F. L. Perry. The company will build commercial vehicles and a combination commercial and pleasure vehicle.

Howarth & Rogers Co., of Amesbury, Mass., whose factory was destroyed by fire recently, have purchased a new three-story brick building, which has been equipped with machinery, and which will be devoted to the manufacture of automobile bodies exclusively.

The new garage of the Cook & Stoddard Co., of Washington, D. C., located in the old riding academy at Twenty-second and P streets, has been opened for business. The company has announced its 1906 line as follows: Locomobile, White, Franklin, Cadillac, Baker electric.

Improvements that give it much additional space are being completed by the Indiana Automobile Company in Indianapolis. This concern recently changed hands and the new management expects to do an increased amount of business during the coming year.

The agency for northern New Jersey for Rainier cars has been placed by the Rainier Company of New York with the New Jersey Motor Car Company, of East Orange, N. J. Sub-agency for the Rainier has also been established in Brooklyn with the Prospect Park South Garage.

The Baker-Cormerias Motor Car Co., Inc., has opened a salesroom in Boston, at 141 Massachusetts avenue; this company has acquired the eastern agency for the Premier cars.

The Auto Cape Top Company, Chicago, has removed from 541 Wabash avenue to 1466 Michigan avenue.

Two recent agencies closed by the Northern Manufacturing Company are as follows: Auburn, N. Y., Auburn Auto Co.; Toledo, O., Atwood Auto Co. The latter company, recently incorporated, is erecting a garage on Monroe street.

In describing the Geecee dry storage battery, manufactured by the Royal Battery Co., of 143 Chambers street, New York, in THE AUTOMOBILE of December 28, the electrolyte used was erroneously referred to as gelatinous; the electrolyte is *non-gelatinous*, and the manufacturers strongly emphasize this point as being of great importance in the success of the battery. The substance used in place of a liquid or of a gelatinous electrolyte is white and spongy, and is said to be capable of retaining moisture indefinitely.

The Brampton chain, imported exclusively by Charles E. Miller, of 101 Reade street, New York, is made in sizes to fit standard American cars. The Brampton chain is extremely strong; it has a connecting link fitted with a bolt and nut instead of the ordinary pin and cotter. Each link is grooved to retain oil, and a single oiling will last a long time.

The Knox Motor Truck Co., Springfield, Mass., announce the sale of four of their three-ton Atlas trucks to the following concerns: Two trucks to the Springfield Provision Co.; one each to Meekins, Packard & Wheat, and T. Shea, all of Springfield.

R. L. Kingston, of 141 West Thirty-eighth street, New York, has secured the agency in this country for the Hamburg tire, made in Germany.

E. R. Thomas, of the E. R. Thomas Motor Company, spent Thursday in New York, going over the plans of the new garage now being constructed for Harry S. Houpt as New York headquarters for the Thomas Flyer.

Manager A. L. Kull, of the Wayne Company of New York, and Jesse Draper, sales manager of the Wayne Company, of Detroit, spent Thursday in Philadelphia, closing the agency for that city.

President A. J. Cassatt, of the Pennsylvania Railroad Company, has just ordered a one-design power boat from the E. H. Godshalk Company, builders of the unbeaten *Nada*.

The Amesbury Brass & Foundry Co., Amesbury, Mass., is now manufacturing castings of aluminum bronze and brass for the automobile trade.

There is a new addition to the numerous garages in Indianapolis, the newcomer being the Federal Automobile Company. The manager is W. A. Carr, who is well known among Indianapolis drivers.

The Northern Motor Car Company, lately incorporated with $15,000 capital stock, will manufacture automobiles in Chicago.

P. C. Rutan, 46 Front street, Port Jervis, N. Y., has secured the local agency for the Wayne cars for 1906.

Among recent sales of 1906 Thomas cars, made through the office of C. S. Henshaw, New England representative of the Thomas Flyer, were to W. H. Wesson, Springfield, Mass.; Danny Maher, Hartford, Conn.; Charles P. Williams, Stonington, Conn.; C. W. Briggs, Norwich, Conn.; F. C. Hood, of the Hood Rubber Co., Boston, Mass.; F. L. Willard, of the Riverside Boiler Works, Boston, Mass.; George H. Gibby, East Boston, and J. H. Cross, Boston.

The organization of the Traverse City Motor Boat Company, of Traverse City, Mich., is now completed and the company will be ready for business as soon as the factory is completed.

R. H. Beacham & Son, well-known livery stable keepers, of Portsmouth, N. H., are agents for the Oldsmobile cars.

W. F. and C. E. Woods, noted basketball players, have taken the agency for Cadillac cars in Portsmouth, N. H.

For the automobilist who is anxious to cover up his lack of skill and experience or the imperfections of his machine, the New York *Globe* has published an "Excuse Book for Automobilists," in which fifty facetious excuses for mishaps of various kinds are given for ready reference. Al. Reeves, the author of the "work," has apparently had an almost inexhaustible source of information to draw from, for he states that there are lots more excuses not printed in the book. The "Book of Excuses" is sent free to anyone who wants one. Apply to the Automobile Department of the *Globe*, New York.

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